WOOD WORKING Digest

JULY 1953

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A HITCHCOCK PUBLICATION

Acceptance under Section 34.64, P.L.&R., authorized

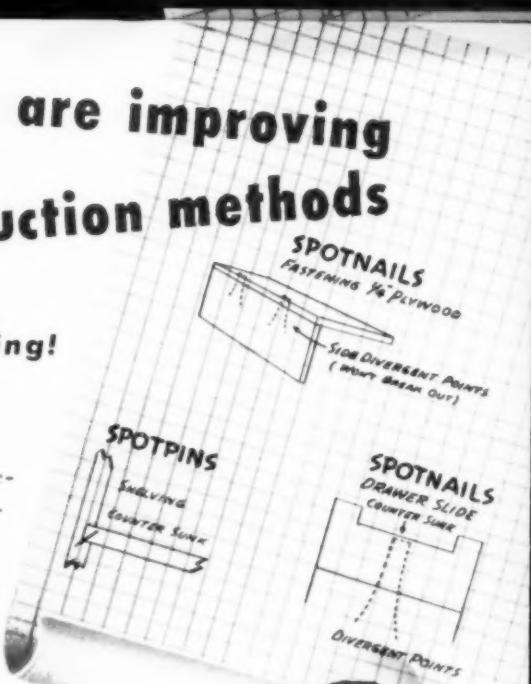
WOOD WORKING DIGEST

222 Willow Ave. Wheaton, Ill.

Form 3547 Requested Return Postage Guaranteed

SPOTNAILS are improving furniture production methods

One shot no-split nailing!



THE SPOTNAILER

Light, portable, virtually indestructible nailing machine drives nail-like wire fasteners in sizes from 3/16" to 1⅛". Use Spotnails for fast, neat assembly of case backs, drawer bottoms and slides, panelling and dozens of other production fastening jobs.

THE SPOTPINNER

The familiar round 12 or 15 gauge sashpin in lengths up to 1¼" are now driven with one blow of a rubber mallet. Use Spotpins for pinning glued or unglued joints. Chisel points cut through grain of wood to avoid splitting. Flush driven or counter sunk without hammer marks.

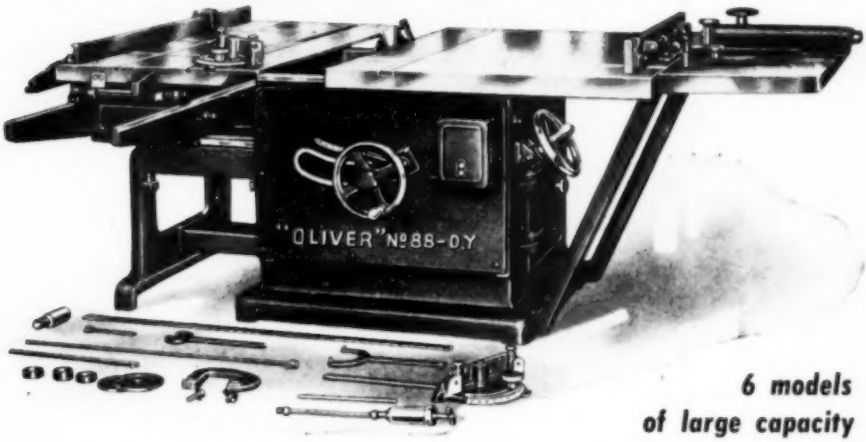
A trial in your own plant will prove our claims of better work—lower cost.

SPOTNAILS, INC.

EVANSTON 1, ILLINOIS

"OLIVER" *wide capacity* MITER SAW BENCHES

simplify the handling of large stock



6 models of large capacity

If your operations call for the handling of stock of extra large dimensions, look into the advantages of the six "Oliver" Miter Saw Benches of large capacity. They produce smooth, accurate work with ease. The No. 88-DY (shown above) has a special rolling table to the left of the saw with 52" travel on V-shaped ball bearing ways, and an 18" extension at right of saw. Rips up to 50" wide. Cuts off up to 46" wide, 2½" thick; or 48" wide, 1" thick. Mechanical brake shuts off current. The arbor tilts up to 45°, and has 4½" vertical adjustment.

There's an "Oliver" Saw Bench to meet your needs best! Write today for complete details.

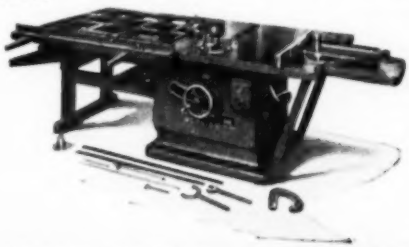
No. 88-DZ—Similar to No. 88-DY but without 18-inch table extension to right of saw.

No. 88-DW—Non-tilting arbor. Non-tilting table at right of saw with table extension. Rolling table at left of saw.

No. 88-DWL—Like No. 88-DW but having greater cross-cut capacity and larger rolling table.

No. 88-DX—Has large main table and table extension at right of saw. (Illustrated below.)

No. 88-DXL—Like No. 88-DX but having greater cross-cut capacity and larger rolling table.



OLIVER MACHINERY COMPANY, GRAND RAPIDS 2, MICHIGAN

You don't have to go *this* far to find coated abrasives to fit your needs. Just look to Armour.

Many woodworking jobs require special abrasives — and many use just regular abrasives. Whatever job you're doing, Armour has a *complete* line of quality abrasives for you to choose from.

This Armour line includes paper, cloth or combination rolls in Electrocoated Garalun or Heat Treated Garnet. There are sheets of cabinet paper, belts, discs, and specialized forms.

If you are drum sanding, finish sanding, working on panels or *any* shape or size of stock, there's an Armour abrasive to help you do a better job for less money.

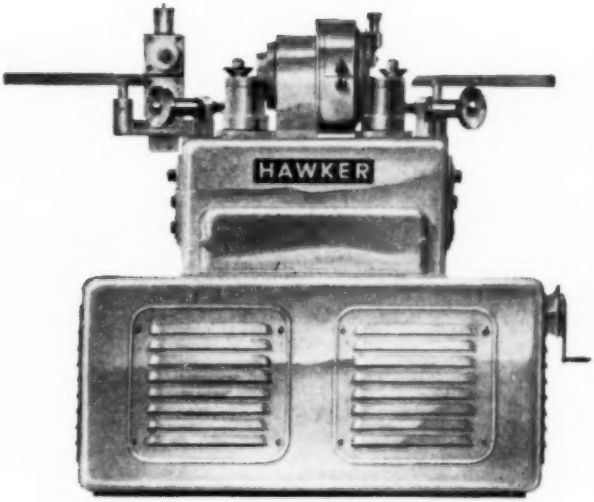
Your Armour representative will be glad to help you select the best abrasive for you. Just write or call him today.

Whatever your woodworking job, Armour has the abrasive you need!

Armour Coated Abrasives can help you do a better job, too!

ARMOUR *Coated Abrasives*

Armour and Company • North Benton Road • Alliance, Ohio



waste less wood

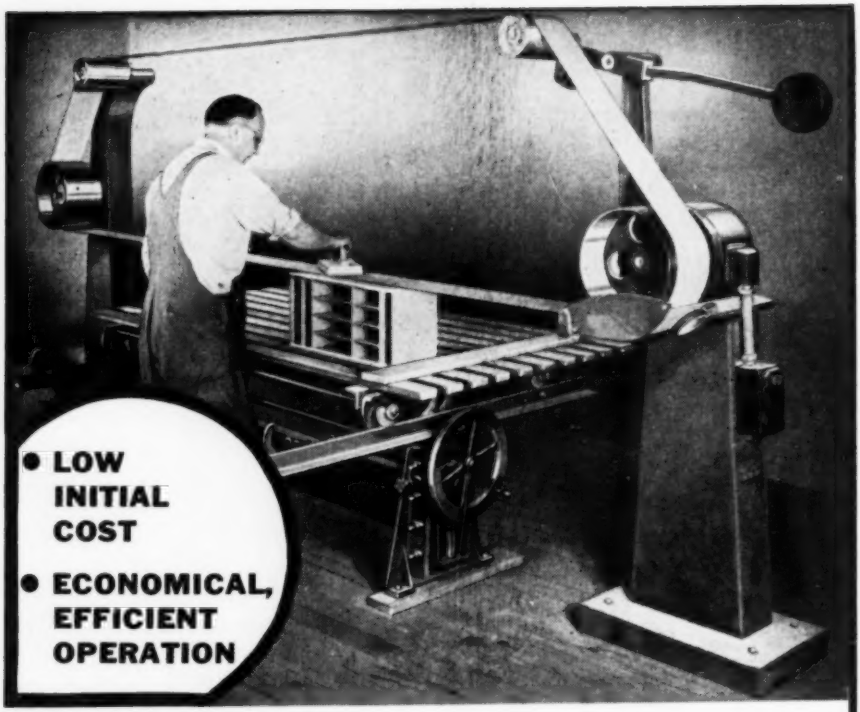
You can do just that two ways with the Model 1000 Hawker Rod and Dowel Machine. First, you will waste less wood because only a very small fraction of the rounds you turn will be malformed or damaged. Second, you will get full round, saleable dowels out of inferior stock, scrap trimmings, off size, or odd shaped squares.

The Model 1000 Hawker is truly a new production machine, with so many features they cannot be detailed here. But there is a completely detailed story about this new Hawker waiting for your request. Write for it today; you should not be without this information.

HAWKER **MANUFACTURING CO.**

1425 KEOWEE STREET, DAYTON 4, OHIO

MACHINES FOR THE NEW AGE OF WOOD

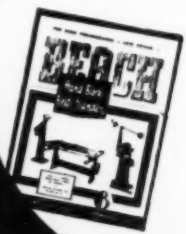


- **LOW INITIAL COST**
- **ECONOMICAL, EFFICIENT OPERATION**

BEACH HAND BLOCK BELT SANDER

Used by more than 1000 leading industrial firms because of its economical efficiency and its versatility. For sanding and finishing wood products and for buffing products fabricated from aluminum, brass, bronze, stainless steel and plastics. Heavy steel construction.

Write for Free Folder



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MONTROSE, PA.

Woodworking digest

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PUBLISHED MONTHLY **Vol. 55, No. 7**

Acceptance under Section 34.64, P. L. and R., authorized Pontiac, Illinois

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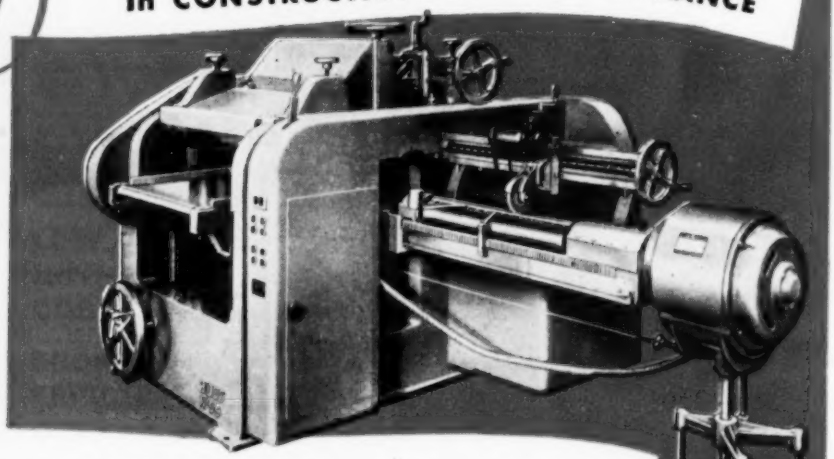
for DOUBLE SURFACING ROUGH LUMBER the BUSS No. 55 is YEARS AHEAD in CONSTRUCTION and PERFORMANCE



If you are looking for the fastest, best and most economical way in which to surface rough lumber, be sure to get the complete details of our No. 55, 30" x 14", Heavy Duty Double Surfacer. It's years ahead of any other planer built for this purpose as a simple comparison of salient features will readily disclose. Note the following structural superiorities:

1. Variable feed — from 30 to 175 ft. per minute. 2. Chromium plated beds and bars — for longer wear. 3 Heavy built-in grinders and jointers. 4. Anti-friction ball and roller bearings throughout. 5. Sectional feed roll and chipbreaker. 6. Large diameter cutterheads with high-speed TUNGSTEN knives for longer wear and smoother finish. 7. Completely motorized with push-button control. 8. Shearing Bar to prevent damage from loose knots. 9. ONE-SHOT lubrication for smooth running and insurance against neglected parts. Write for complete description. Ask for bulletin 55.

FLOORING MILLS and KINDRED PLANTS

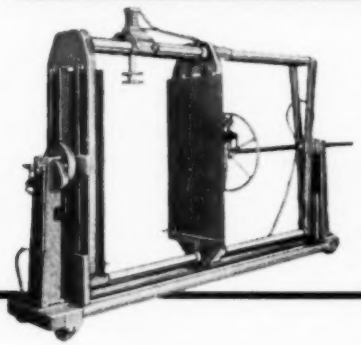
No. 55 is also available in 20-inch width with speed stepped up to 275 ft. per minute. This model has proved itself a "bear-cat" for Flooring Mills and similar operations. Let us tell you about it.

BUSS SINCE 1862 **MACHINE WORKS**

PLANER SPECIALISTS EXCLUSIVELY

234 EIGHTH STREET
HOLLAND, MICHIGAN

Clamps

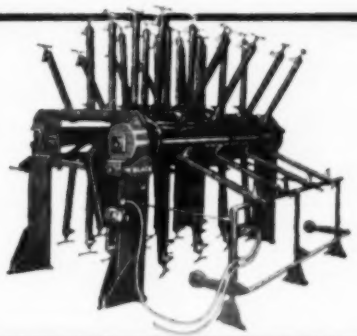


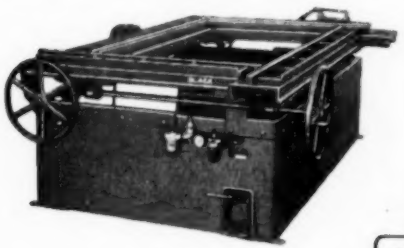
CASE CLAMPS

Massive tubular supports are mounted as fixed preloaded beams that will remain rigid and true, insuring accurate work under any load. No cast iron is used in any strain receiving member. Convenient controls and a powerful brake make operation easy and accurate. Write for Bulletin 11-J.

CLAMP CARRIERS

Black Clamp Carrieres are made in a practically unlimited range of sizes with respect to the number and width of sections and number, length and style of clamps. Carriers are made entirely of arc-welded and fabricated steel, providing an unbreakable frame and permitting flexibility of design. Write for Bulletin 11-K.





SASH AND FRAME CLAMPS

Black's two-way pneumatic clamps are mounted on a rigid, solid steel base with all controls conveniently grouped at the front. Valves and air supply lines are protected from damage by this base. Black clamps have been tested under production conditions, and proven to be fast, efficient and reliable. Write for Bulletin 11-M.

"If its gluing equipment—we have it"

THE BLACK BROTHERS CO., INC. 810 9th ST., MENDOTA, ILLINOIS

The right Glue for your job

plus an inherent willingness to understand YOUR adhesive problems and help you solve them.

plus periodic check-up visits from sales technicians who know glues and glueing techniques.

plus same day shipment on all but tank car, tank truck and special orders.

plus technical glue room help until your crews know best methods of application.

Do you get these PLUSES from your present glue source?

If you're in the market for a glue source that gives you that *"additional something"* our customers get—phone the office nearest you today.

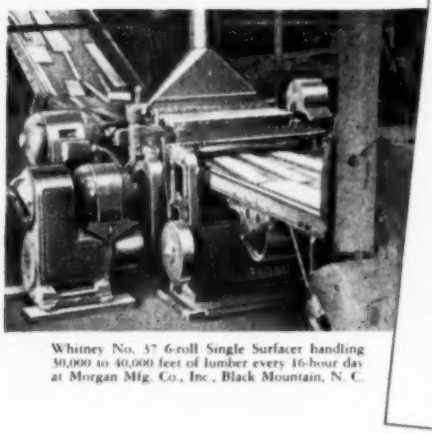
You'll Stick with us Because we Stick for You!

National Casein

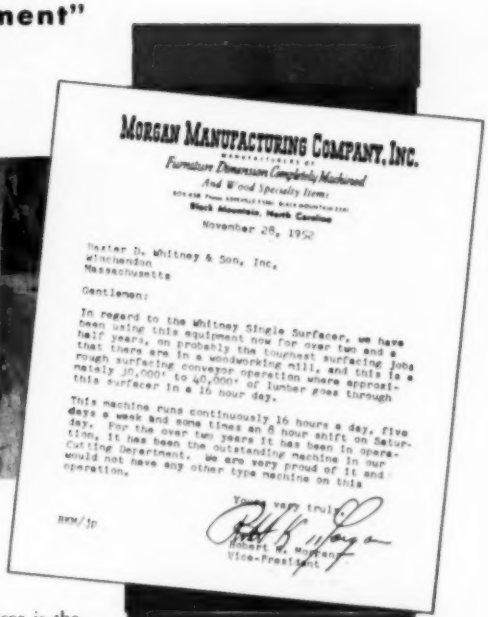
601 W. 80th St., Chicago 20, Ill. • Broad and Fulton Sts., Riverton, N. J.

"The outstanding machine in our cutting department"

Robert K. Morgan
Vice-President
Morgan Mfg. Co., Inc.



Whitney No. 37 6-roll Single Surfacer handling 30,000 to 40,000 feet of lumber every 16-hour day at Morgan Mfg. Co., Inc., Black Mountain, N. C.



MORGAN MANUFACTURING COMPANY, INC.
MANUFACTURERS OF
Furniture Dimension Completely Machined
And Wood Specialty Items
Black Mountain, North Carolina

November 28, 1952

Baxter D. Whitney & Son, Inc.
Winchendon
Massachusetts

Gentlemen:

In regard to the Whitney Single Surfacer, we have been using this equipment now for over two and a half years, on probably the toughest surfacing jobs that there are in a woodworking mill, and this is a rough surfacing conveyor operation where approximately 30,000' to 40,000' of lumber goes through this surfacer in a 16 hour day.

This machine runs continuously 16 hours a day, five days a week and some times an 8 hour shift on Saturday. For the over two years it has been in operation, it has been the outstanding machine in our Cutting Department. We are very proud of it and would not have any other type machine on this operation.

Yours very truly,

Robert K. Morgan
Vice-President

RKM/jp

A Whitney No. 37 6-roll Single Surfacer is the subject of this interesting letter from Mr. Morgan of the Morgan Mfg. Company, Inc., Black Mountain, N. C. Satisfied users of Whitney Single and Double Surface Planers do not hesitate to pay tribute to woodworking machinery that justifies itself thru an outstanding performance and production record.

Whitney Surfacers are designed for specific surfacing assignments, and get results. Whatever your surfacing problem call in your Whitney man for help. Send for Single Surfacer bulletin DS7 or Whitney Double Surfacer bulletin DD7.

BAXTER D. WHITNEY & SON, Inc.
WINCHENDON, MASSACHUSETTS, U.S.A.

In Our 116th Year

PLANERS • SHAPERS • AUTOMATICS • VARIETY SAWS • BACK KNIFE LATHES

There's a **DELTA** Band

DELTA 14" BAND SAW

DELTA QUALITY AT LOW COST

CAPACITY:

Blade to Frame 13¾"; Under Guide 6¼" (12¼" with low cost attachment)

A precision built tool that makes fast, accurate cuts at minimum cost. Has 14" x 14" table that tilts 45° right, 10° left with positive stop at level position. Widely spaced trunnions give table extra rigidity for heavy work. Guides and ball bearing blade supports adjust independently with micrometer accuracy. Special sanding attachments available.

DELTA 20" BAND SAW

BIG CAPACITY — BIG VALUE

CAPACITY:

Blade to Inside Column 19¾"; Under Top Guide 13⅜"; Under Wheel Frame 12⅛"

This big capacity production machine has a finish ground table 20⅜" wide by 24¼" long. A ⅜" x ¾" slot is provided for mitre gauge. Table tilts 45° right, 12° left—locks securely in any angle. Ball bearing blade guides assure precision, reduce blade breakage. Micrometer adjustment screws are within easy reach. For complete safety only the actual working surface of the blade is exposed.

DELTA MILWAUKEE

DELTA QUALITY MAKES THE DIFFERENCE

Saw For Every Purpose!

SELECT THE SIZE AND CAPACITY YOU NEED

Get Production Speed and Accuracy at Low Cost

In a woodshop there is no limit to the usefulness and all around economy of a Delta Band Saw. With a Delta Band Saw you can handle *big-capacity* curve cutting, taper work, resawing, cut off and ripping. Cut one piece at a time or do mass cutting with power to spare. Using Delta accessories, do high-speed sanding and finishing.

In band saws, Delta Quality construction means two things to you . . . precision accuracy for the most delicate cutting . . . and extreme durability for minimum maintenance. Delta engineering, too, means longest blade life. These are the power tools that give you the most in wood shop versatility and high speed production.

Consult your experienced Delta Dealer . . . He is listed in the classified pages of your phone book under TOOLS or MACHINERY. Or write for a completely illustrated Delta catalog. Delta Power Tool Division, Rockwell Manufacturing Company, 666G N. Lexington Ave., Pittsburgh 8, Pa.

DELTA 36" BAND SAW

HEAVY DUTY
FINEST AVAILABLE

CAPACITY:

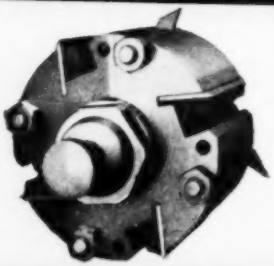
Blade to Inside Column 35¼";
Height Under Top Guide 16";
Height Under Wheel Frame 16"

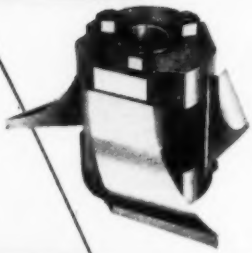
Recognized by industry as the finest band saw available. Has massive 38" x 32" finish ground tilting table—also 16" x 21" sub-table. Big balanced 36" diameter x 2" face wheels run in sealed-for-life ball bearings. Blade guides are fully adjustable, easy to get at, accurate to micrometer precision. For assured safety the welded steel cabinet completely encloses all moving parts except surface of blade.

DELTA QUALITY POWER TOOLS

Another Product by **Rockwell**

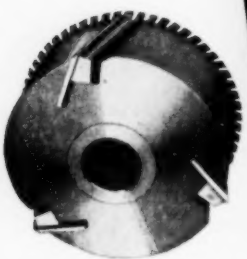
EKSTROM, CARLSON

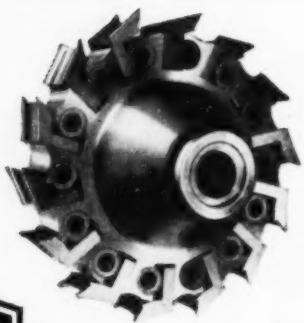




HEADS...

Here you see a few Ekstrom, Carlson cutterheads — typical of the different types and sizes available. ECCo heads are accurately made and carefully finished, to give consistent performance on the job. For uniform and reliable results, be sure to order EKSTROM, CARLSON cutterheads.





ECCO MACHINERY AND TOOLS SINCE 1904

EKSTROM, CARLSON & CO., Dept. W-9 1400 Railroad Ave., Rockford, Ill.

Larger, Lighter Rafters

LAMINATED TO LAST

with Penacolite® Resorcinol Adhesives

● Wherever storage space is a major consideration, as in this dairy barn, high Gothic-type laminated rafters are especially recommended. They provide large, unobstructed floor area, making available extra space for the storage of hay and other foods. These rafters were manufactured by Unit Structures, Inc., of Peshtigo, Wisconsin.

Each "Penacolite"-laminated rafter is a continuous member from foundation to roof ridge, combining wall and roof construction in one unit. This feature provides great structural strength and exceptional wind resistance, in addition to reducing construction costs. Yet, despite their strength "Penacolite"-laminated rafters are light, easy to handle.

Once cured, "Penacolite" bonds are as strong as the woods they join, under all conditions of service. They are unaffected by high heat and high humidity changes.

And because "Penacolite" bonds are waterproof, they are ideal for use in buildings such as this dairy barn, where extreme conditions may be expected.

For complete information on "Penacolite" Adhesives, write today for our free illustrated booklet.

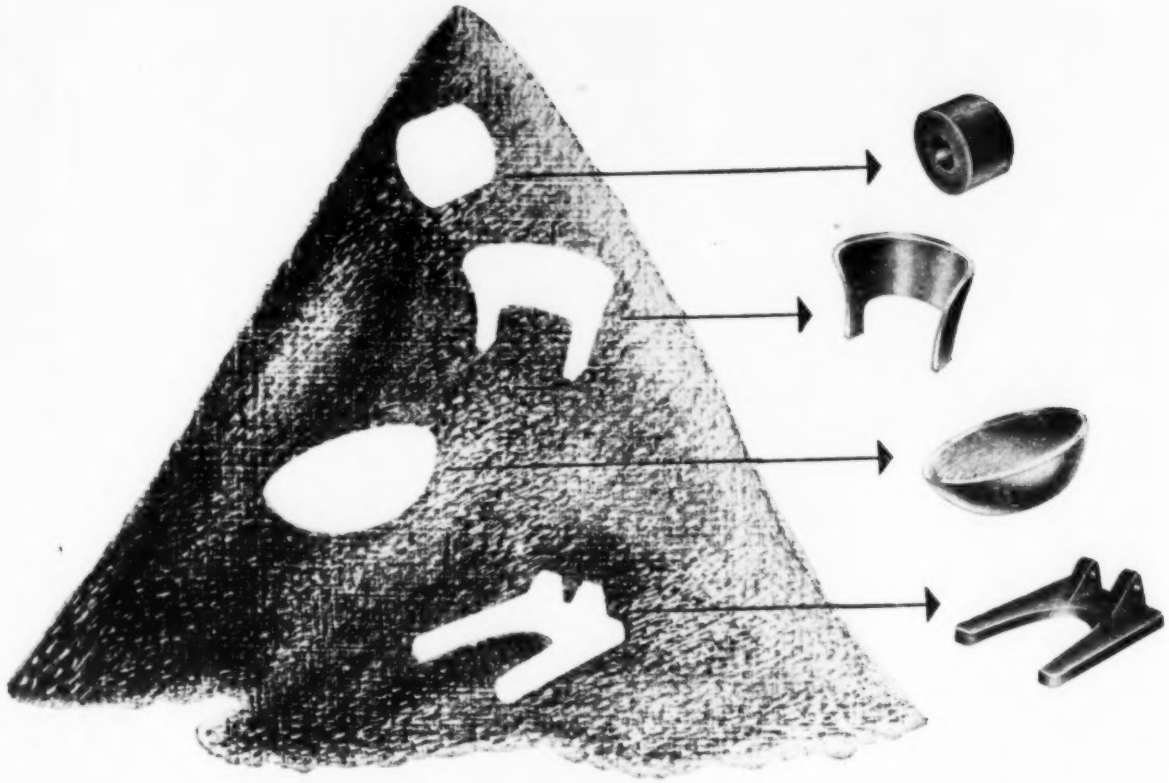
KOPPERS

KOPPERS COMPANY, INC.

Chemical Div., Dept. WWD-83 Pittsburgh 19, Pennsylvania

PENACOLITE® RESORCINOL ADHESIVES

The original resorcinol, waterproof, room-temperature-setting adhesives



How to turn wood waste into a profit

How to turn wood waste

...with RESINOX 743

Instead of *spending* money to get rid of wood waste, many mills and companies use their scrap to *make* money . . . by molding chips, sawdust and shavings into saleable products with Monsanto Resinox phenolic resin.

Just a few of the profitable items of molded wood on the market today include chair backs and seats . . . knobs . . . wheels . . . bases for parts and instruments . . . hamper tops . . . toys . . . sporting equipment . . . and high-style wooden housewares.

For the very best results Monsanto recommends a new research-built phenolic resin, Resinox 743. Because of its extra-high initial flow and rapid cure, Resinox 743 permeates throughout the granulated wood, completely knitting the wood particles together. This results in molded products with greater strength, greater screw-holding power, excellent water resistance, and far better dimensional stability.

In addition to Resinox 743, Monsanto supplies a number of powdered phenolic, melamine and urea resins with particular advantages for various molded wood processes and applications.
For full information on Resinox 743, as well as the big family of Monsanto adhesives, please write: MONSANTO CHEMICAL COMPANY, Plastics Division, Room 5311, Springfield 2, Mass.
(Monsanto in Canada: Montreal) Resinox Reg. U. S. Pat. Off.

MONSANTO®

SERVING INDUSTRY . . . WHICH SERVES MANKIND

Adhesives for Western Industry

Monsanto's Western Division manufactures and supplies a complete line of plywood and woodworking adhesives for western industry from conveniently based plants in Seattle, Washington and Santa Clara, California.

Phenolic, urea, resorcinol, protein and blend glues are included in this complete line for plywood production, edge gluing, and general assembly gluing.

For information on these adhesives, and on the entire line of Monsanto adhesives sold west of the Rocky Mountains, write to: MONSANTO CHEMICAL COMPANY, 911 Western Ave., Seattle 4, Washington.

WHAT DOES FIRTH STERLING OFFER YOU?

(ANSWER NUMBER 1)

NEW METALS FOR AN ATOMIC AGE

"PIONEERS OF THE *UNCOMMON*" IN METALLURGY

For 64 years we have been pioneering in the research, development and production of special purpose steels and, more recently, powdered metals.

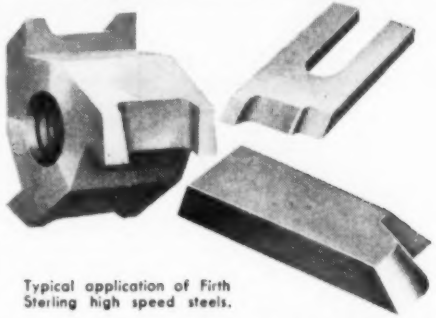
Not content to become just another tonnage producer of established grades, Firth Sterling has successfully paced the field in *anticipating* the requirements of science and industry, so that the exactly *right* metal is *ready* when a new need arises.

Now, in an era of jet engines and atomic power, Firth Sterling *has* the necessary high temperature alloys and

NO AXE TO GRIND!

Both Steel and Carbide have their place in woodworking tooling. Firth Sterling has 'em both!

Tool manufacturers and their customers can get exactly what they need and save time and money, when they specify Firth Sterling. For Firth Sterling produces *both* high speed



Typical application of Firth Sterling high speed steels.

tool steels, in all grades required by the woodworking industry, and standard or special shape carbide

Now in an era of jet engines and atomic power, Firth Sterling *has* the necessary high temperature alloys and cermets, Firth heavy metal, chromium carbides, zirconium alloys, and stainless specialties . . . as well as both new and conventional grades of high speed steels, tool and die steels, and sintered tungsten carbides.

To accomplish this metallurgical preparedness, research at Firth Sterling had to be expanded several fold. The best of new American and European processes and equipment were blended into integrated production facilities. The metallurgical brains of the world are "picked" regularly by consultation with Firth Sterling's international panel of renowned scientists and engineers.

The job is done, for today, yet *even* today we are already working on the metallurgical needs of tomorrow.

Your inquiries are invited.

Firth Sterling Stands for Metallurgical Achievement—Past, Present, Future

I-1

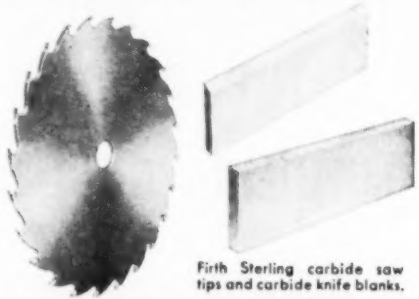
Firth Sterling

—INC—

GENERAL OFFICES: 3113 FORBES ST., PITTSBURGH 30, PA.

OFFICES* AND WAREHOUSES: BIRMINGHAM* CHICAGO CLEVELAND DAYTON* DETROIT HARTFORD HOUSTON* LOS ANGELES NEW YORK* PHILADELPHIA* PITTSBURGH* WASHINGTON*

standard or special shape carbide tips and blanks for saws, milling cutters, knives, and special tools.



Firth Sterling carbide saw tips and carbide knife blanks.

Consult your tool manufacturer . . . your regular source of supply. He can get prompt service from manufacturing facilities and commodity stocks in Pittsburgh on both steel and carbide.

CALL YOUR FIRTH STERLING REPRESENTATIVE . . .

If you have a tooling problem. He can give you unbiased recommendations . . . either for steel or carbide as the job requires!

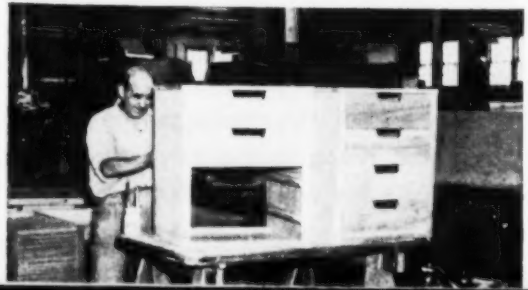
P-3

PRODUCTS OF FIRTH STERLING METALLURGY

High Speed Steels
Tool & Die Steels
Stainless Specialties
High Temperature Alloys
Sintered Tungsten Carbides
Firth Heavy Metal
Chromium Carbides
High Temperature Cermets

Gluing and squaring cabinets in one operation. Mortise and tendon joints in the base and blind mortises at the top. Since absolute squareness is necessary, glue must not chill off or lose adhesive strength too fast, yet must set rapidly once clamps have been tightened and squareness is assured.

Putting the final touches on Orsenigo's famous finish. WOOD-LOK's invisible glue line permits Orsenigo to enhance its fine cabinet work with superb finishing.



Orsenigo's Fine Furniture, Famous for Quality, Assembled with WOOD-LOK®

Fitting drawers. The high strength bond achieved in the initial squaring operation provides a permanent smooth fit. Fitted dovetail construction is strong, tight, and non-crazing.

Laying up wardrobe panels for institutional furniture. Again, WOOD-LOK's long open assembly time permits accurate fitting and assures permanent squareness of these cupboard sides. Construction is extra heavy to withstand rough handling in college dormitories, hotels, hospitals, and other institutions.

Family tradition has maintained top quality standards at the Orsenigo Company since it was founded a century ago in Italy. The company was established in this country in 1893 and is now located in Westerly, Rhode Island. Orsenigo makes fine furniture, much of it for nationally known decorator-architects who specialize in complete institutions.

Five years ago, Orsenigo found it could speed production and maintain quality by using National's WOOD-LOK glue for assembly work. WOOD-LOK is ready for use. No time lost in preparing glue. No chance for error in mixing. And it has a storage and working life of many months.

For full information on WOOD-LOK, write—

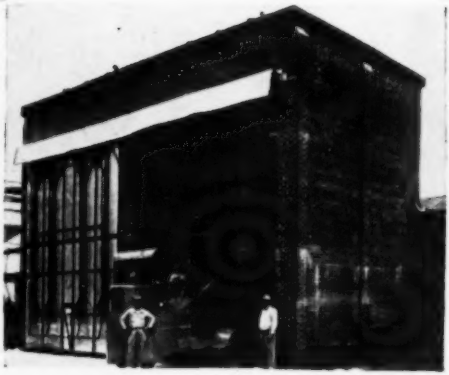
National
ADHESIVES

270 Madison Avenue, New York 16, N. Y.

Yours for **FASTER, EASIER LOADING AND UNLOADING**

Standard

PACKAGE KILNS!



TELL CITY CHAIR COMPANY

Chair Makers Since 1865

TELL CITY INDIANA

reports: "We have been operating our two STANDARD package kilns for 1½ years and are more than pleased with them. Since they are loaded with a lift truck and have no tracks and no kiln trucks to handle, loading and unloading is faster and easier. Their design gives better circulation and heat control than we ever achieved with our larger track kilns. With our STANDARD package kilns we can segregate mixed loads and thus get maximum capacity."

Manufacturers of Internal Fan Kilns

Write for free Standard Catalog

STANDARD

Engineers and Manufacturers Since 1897

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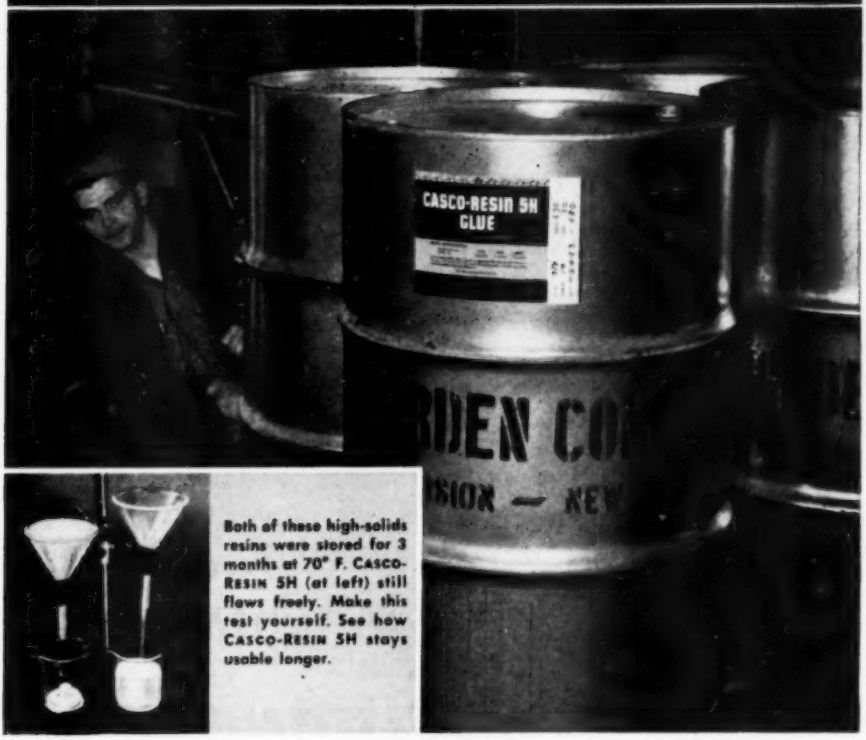
P. O. BOX 5708 • INDIANAPOLIS, INDIANA

Borden's NEW CASCO-RESIN 5H LIQUID UREA RESIN GLUE...



Both of these high-solids resins were stored for 3 months at 70° F. CASCO-RESIN 5H (at left) still flows freely. Make this test yourself. See how CASCO-RESIN 5H stays usable longer.

ends summer glue-storage problems

CASCO-RESIN 5H is a high-solids urea resin, yet it stays usable for over 6 months at 80° F storage . . . over 3 1/2 months at 90° F. Often allows purchasing in larger volume, lower-cost quantities. Saves storage space in drums or tanks.

But that's only one advantage of this new and better Borden glue.

CASCO-RESIN 5H boosts production because it's faster curing without sacrifice of pot life or assembly time. It up-grades your products because it provides improved water-resistance, particularly with flour-extended mixes. It saves clean-up time because it's highly water miscible, flushes quickly from equipment.

And the low-cost catalyst system provides mixes for every type of urea resin gluing . . . hot press, cold press, R F heating or hot-plate edge-gluing.

A production run in your own plant will show you the difference. Just write, wire or call . . . and we'll have a Borden service man set up the demonstration.

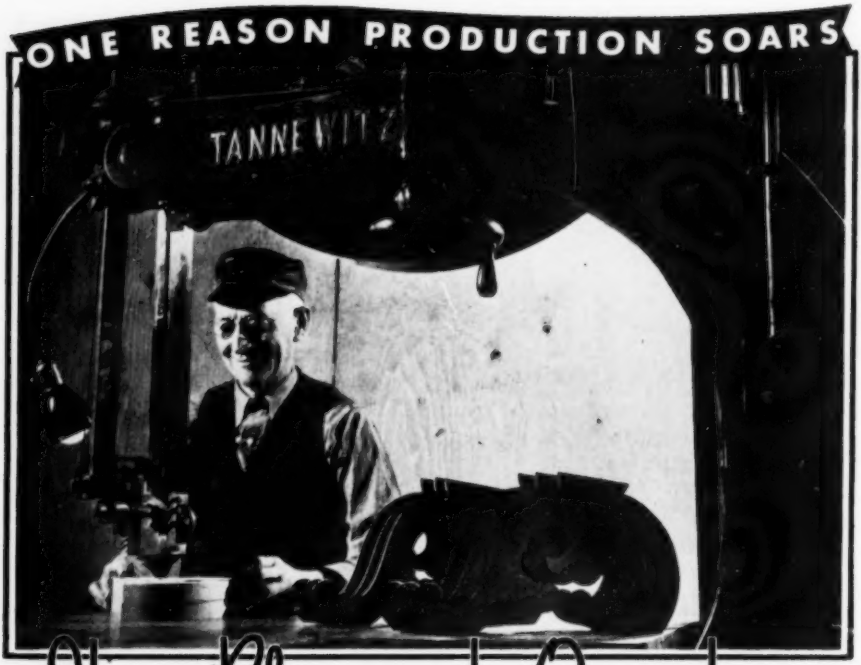
Address: The Borden Company, Chemical Division, Dept. WD-73 350 Madison Avenue, New York 17, New York. 632

INDUSTRIAL ADHESIVES DEPARTMENT

THE BORDEN COMPANY

Chemical Division

ONE REASON PRODUCTION SOARS



It's a Pleasure to Operate...

A **Tannewitz**

HIGH SPEED BAND SAW

Cuts are made so smoothly, effortlessly, even in multiples as thick as 2 feet. Geared Guide Post and other conveniences make adjustments so easy. The built-in dust syphon takes care of the dust regardless of blower system. And the machine is absolutely vibrationless. No wonder that bandsawing production vastly increases where these machines are installed. It's a pleasure to operate a Tannewitz High Speed Band Saw.

Compare Tannewitz construction. It assures a life-time of perfect service and by far the greatest ultimate return on your equipment investment. For complete details write for Bulletin GH.

SAWING MACHINERY SPECIALISTS

The TANNEWITZ WORKS GRAND RAPIDS, MICHIGAN

"Does a smoother job than any sander we've ever tried" *

* reports:
Mr. George Potthast
Potthast Bros., Inc.
Baltimore, Maryland

Black & Decker Utility
No. 88 SANDER
(4½" x 11" sanding area)
$64.50

Black & Decker Utility
No. 44 SANDER
(3⅔" x 9" sanding area)
$46.95

"10 Times Faster"—"Eliminates Tiring Hand-Sanding"

POTTHAST BROS., INC. specialize in fine reproduction furniture, so quality is their foremost objective. Mr. George Potthast, after trying the new B&D Utility No. 88 Sander, says, "We've tried lots of power sanders—but they all left lines in the work, and we had to set them aside. This new sander is different—it does a beautiful job; it eliminates tiring hand-sanding; and it's ten times faster! It's a wonderful tool!"

Outstanding features of the B&D Utility No. 88 Sander include sanding plate extending beyond housing for close quarter work, quick-change paper holder, modern switch handle and auxiliary knob handle with choice of three positions for better control. For free demonstration, see your nearest Black & Decker outlet! THE BLACK & DECKER MFG. CO., 635 Pennsylvania Ave., Towson 4, Maryland.

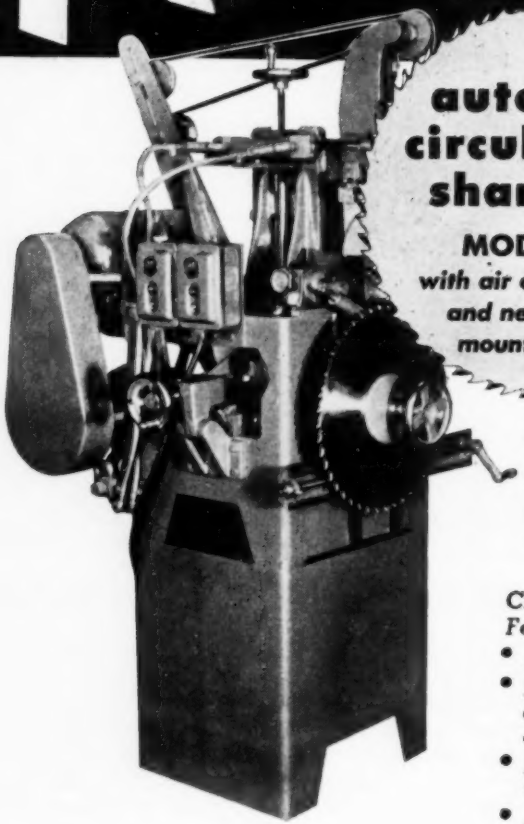
Black & Decker
UTILITY
PORTABLE ELECTRIC TOOLS

HANCHETT

automatic circular saw sharpener

MODEL 724

with air operated shift and new pedestal mounting stand



Low-cost, full-automatic sharpening for RIP and CROSS-CUT saws from 6" to 36" diameter.

Check these Production Features:

- *Accurate Action.*
- *New Mechanism, controls bevel grind on cut-off teeth.*
- *Double Side Head, vertical — horizontal.*
- *Adjustable Tooth Cam.*

Write us about our complete line of Saw Sharpeners for all types and sizes of Saws.

HANCHETT MANUFACTURING COMPANY

World's largest manufacturer of knife grinding and saw sharpening machinery

MAIN OFFICE — Big Rapids, Michigan **WEST COAST — Portland, Oregon**

COVEL SAW SHARPENERS · HANCHETT KNIFE GRINDERS

Siempelkamp

SHOWS THE WAY To Cut Production Costs

Complete line of hydraulic hot plate presses and veneer dryers offers low first-cost and stepped-up efficiency through advanced design. Made in world's largest hydraulic press plant at Krefeld, Germany. Complete U. S. service.

At left is one-piece frame 4'x8' press with 15 openings . . . Veneer dryer with cooling section (below) has unique patented features giving highest drying capacity per square foot.

More than 5 presses of this model installed during year.

For FREE Literature Write

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Machine Works
1301 North Hollywood St.
Memphis 8, Tenn.
Tel. 4-0120

Or West of the Rockies:

HEYER
Sales & Engineering Co.
1003 Washington Bldg. Seattle LOgan 0921
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Behind every successful application of **DIELECTRIC HEATING** you'll find **WESTINGHOUSE**

NIGHT SHIFT ELIMINATED, LABOR COST REDUCED 57%, $10,000 SAVED ANNUALLY

Edge-gluing—one of first and foremost uses for Westinghouse Dielectric Heating—is shown here as used by Williams-Brownell. A Westinghouse 10KW generator is the backbone of this setup. Combined with a Hart-Union Electrogluer, the installation is certified for FCC regulations. The speed and quality of panel production resulting from this combination can bring extraordinary economies to you, too. For further information, write Westinghouse Electric Corporation, Dielectric Heating Section, 2519 Wilkens Avenue, Baltimore 3, Maryland.

J-02258

YOU CAN BE SURE...IF IT'S

Westinghouse

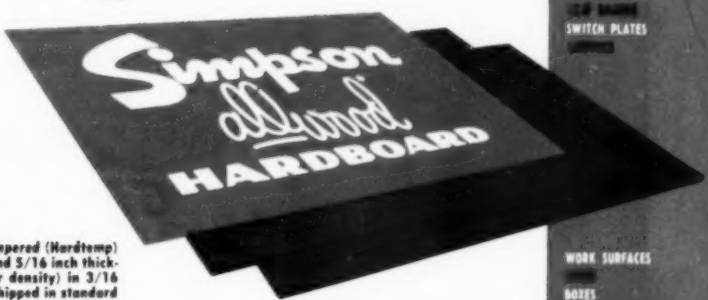
Smooth

Betty Schalow, sparkling star of Shipstads and Johnson Ice Follies of 1953.

Simpson Allwood Hardboard is s-m-o-o-t-h and hard, without the cold hardness of glass or metal. It has the *warm*, friendly feel of natural wood; naturally, because it is *all* wood. Its natural wood fibers have been rearranged in an interwoven mass, bonded with natural wood resins, and compressed to great density under heat and pressure. Having no grain, Simpson Allwood Hardboard cannot split or splinter. Its surface, as s-m-o-o-t-h as the polished stainless steel plate against which it is pressed, requires none of the expensive processing required to make ordinary wood smooth; sanding, filling in the soft areas in the grain, re-sanding and rubbing. Use Allwood Hardboard wherever a smooth surface is an asset, for drawer bottoms that won't snag sheer nylons, playpen floors, safe for tender skins; counter, table and bar tops; chutes and slides . . . and many, many other things.

The all-wood multi-purpose material for...

- FURNITURE
- APPLIANCES
- DISPLAYS
- MACHINERY
- PLAYPENS
- FILES
- RACKS
- TRAYS
- CABINETS
- PANELS
- SHOWCASES
- TRAILERS
- CHUTES
- BARS
- TANKS
- LOCKERS
- CHART HOLDERS
- SWITCH PLATES
- WORK SURFACES
- BOXES
- TOOL CHESTS
- BIRD HOUSES

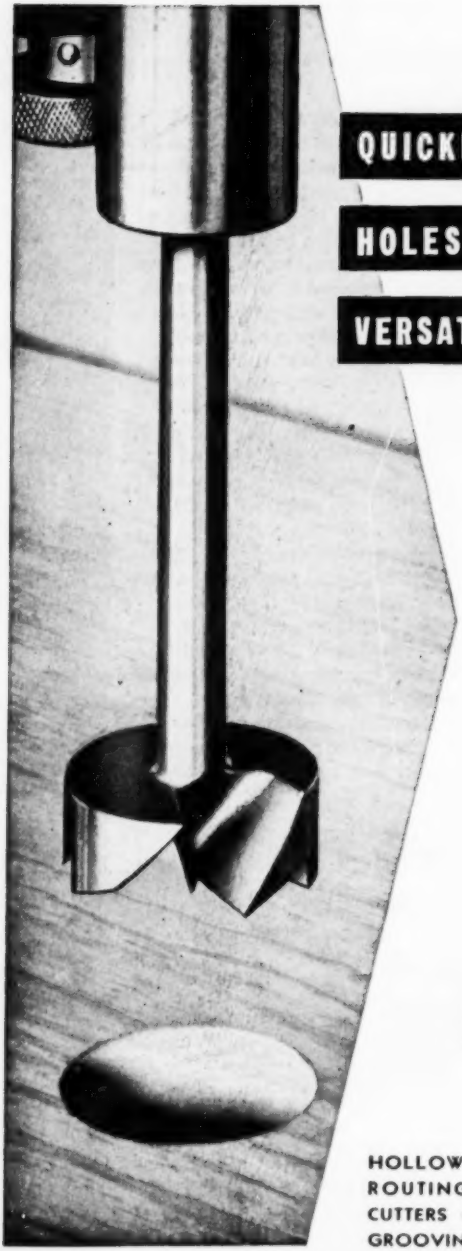


Available in *Standard* and *Tempered* (Hardtemp) in 1/10, 1/8, 3/16, 1/4 and 5/16 inch thicknesses, and in Hardlite (lighter density) in 3/16 and 1/4 inch thicknesses. Shipped in standard stock sizes, or precision cut at a mill to any square or rectangular dimensions you require.

for samples, literature and prices:

Hardboard Division, Simpson Logging Company, Stuart Building, Seattle 1; MUtual 2828. Teletype SE 237.

*T. M. ORE. LBR. CO.



QUICKLY BORE SMOOTH HOLES UP TO 3" WITH THIS VERSATILE MULTI-SPUR BIT

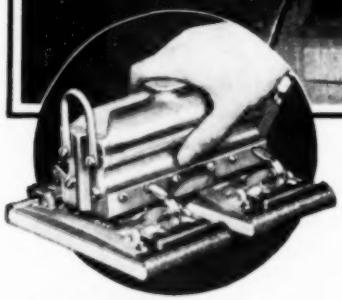
A fast, smooth-boring bit for those special jobs beyond the scope of the usual machine bit. Bores any arc of a circle on an edge of a piece of stock. Operates well in either soft or hard woods and is often preferred for end-grain work. Smoothly bores veneered stock without tearing and will bore at an angle, overlapping, or at close centers without splitting stock. Stocked in sizes ½ to 3". Write for facts. Greenlee Tool Co., 2137 Herbert Avenue, Rockford, Illinois.

TOOLS FOR CRAFTSMEN

GREENLEE

HOLLOW CHISELS • MACHINE BITS • DRILLS
ROUTING BITS • MULTI-SPUR BITS • PLUG
CUTTERS • COUNTERSINKS • MAKERS OF TECO
GROOVING TOOLS FOR TIMBER CONSTRUCTION

Providing a basis for quality finishes by RWAY FURNITURE CO., INC.



FOUR MODELS FOR ALL SANDING REQUIREMENTS

. . . ranging from a versatile single-pad model to a heavy-duty double-pad sander. Each available for all finishing operations. Get complete specifications.

Sundstrand Air Sanders are used by the RWAY Furniture Co., Inc. of Sheboygan, Wis., in several phases of the preparation and final finishing of their bedroom and dining room furniture. RWAY realizes it's very important to the quality of their finished products to have all sanding steps uniform. Sundstrand straight-line sanders provide the necessary smooth surfaces, free from swirls and pressure marks, that assure high quality appeal for RWAY furniture. Perhaps Sundstrand Sanders are the answer to your finishing problems. Write for bulletin WW-7.

Canadian Distributors

Railway & Power Engineering Corp. Ltd.
169 Eastern Ave.
Toronto 2, Ont.

•

Upton Bradeen & James Ltd.
890 Yonge St.
Toronto 5, Ont.

SUNDSTRAND

SUNDSTRAND AIR SANDERS

SUNDSTRAND MACHINE TOOL CO.

PNEUMATIC DIVISION, ROCKFORD, ILLINOIS

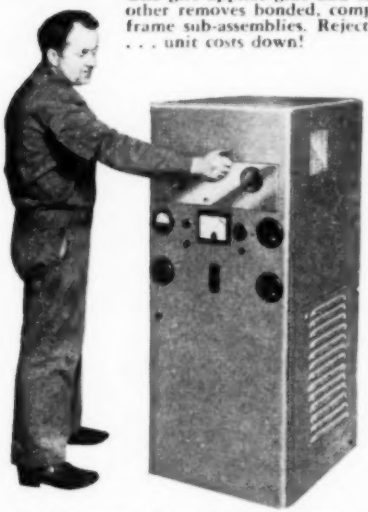
for a fabulous finish...

JEWEL BRAND
Abrasive Belts

Finer finishing — sanding, smoothing, polishing — for all types of wood products.

ABRASIVE PRODUCTS, INC.
551 Pearl Street **South Braintree 85, Massachusetts**

One girl applies glue and loads the machine, the other removes bonded, completely cured panel to frame sub-assemblies. Rejects virtually eliminated . . . unit costs down!



This Thermex 3-kw Bonding Equipment permits you to cut costs on many bonding operations. It's compact and portable. Time is saved by dual-load switch, while one load is being bonded, the other can be prepared.

Modernize... and cut unit costs!

● The only way to beat high costs of materials and labor is by more efficient production. Find out how you can modernize your production with THERMEX* Bonding Equipment. It's boosting output per manhour in hundreds of woodworking plants. Have a Thermex field engineer study your operations and make recommendations. Write the Girdler Corporation, Thermex Division, Louisville 1, Kentucky.

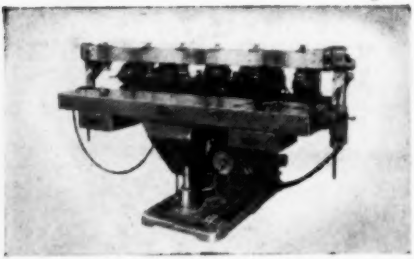
*THERMEX—Trade Mark Reg. U. S. Pat. Off.

Choose Thermex Bonding Equipment for:

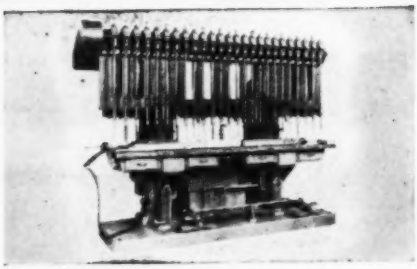
EDGE-BONDING LUMBER · FABRICATING ASSEMBLIES · BONDING PLYWOOD
BONDING PANELS-TO-FRAMES · MOLDING LAMINATED PARTS

The **GIRDLER** *Corporation*

Thermex Division



STYLE D-200

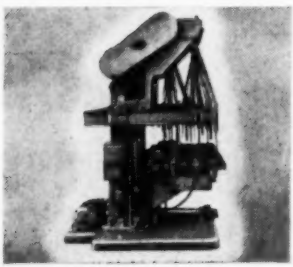


STYLE CCH

ROOT Boring Machinery

A Few of our 33 Different Wood Boring Machines . . .

STYLE G-250



STYLE CXH

STYLE D-150

ROOT machines are used for all types of single and multiple spindle boring. A few representative models from our extensive line are shown above. If you do not see a machine for your needs, write for our catalog.

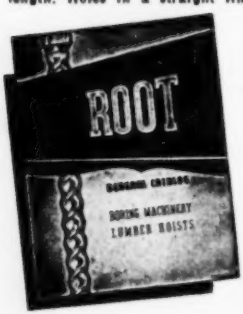
Style CCH is a large multiple spindle hydraulic feed machine for boring as many as 44 holes at one time in stock 12 feet long. A labor-saving machine for makers of agricultural implements, ladders, and other work requiring long stock.

Style D-200 is a highly developed machine for diversified boring found in furniture factories. Hydraulic spindle feed, geared-head individually motorized spindles, and automatic adjustable work clamps are a few of the features found on this widely used machine.

Style CXH is a flexible machine with universally adjustable spindles and stepless hydraulic feed. It has a 22" crossline spindle adjustment and a 4 to 6-foot boring length. Holes in a straight line or irregularly spaced patterns can be bored productivsly with a high degree of accuracy.

Style D-150 Radial Borer is a foot and hand-feed machine with more capacity than existing two spindle machines. Twenty-four-inch spindle-spread geared-head motorized spindles that are fully adjustable are a few of the many features of this borer. A perfect machine for the shop that does not need automatic power-feed machine equipment.

Style G-250 Boring and Mortising Machine is a foot feed machine of the general utility type. Powerful 3 h.p. 2 speed motor for large hole boring and mortising. Other features include table with universal tilt, two leverage points for light and heavy boring, totally enclosed motor, chip blower, spindle in head construction. Mortising chisel interchangeable with boring chuck. Many other features described in free bulletin on this machine.



SEND FOR THIS FREE CATALOG

Get the complete data on the complete Root line of Boring Machines and Lumber Hoists from our new catalog. Write today on your company letterhead for your copy of Catalog 173-A.

B. M. ROOT CO.
YORK, PENNSYLVANIA

Headquarters for Boring Machinery and Lumber Hoists for 41 years

"Our two SKIL Belt Sanders finish over 2000 board feet every week!"

says **Henry Vakoc,** owner,
ABC Cabinet and Woodwork Shop,
Minneapolis, Minn.

Makers of custom-built cabinets and general woodworking items for the home, this firm uses two SKIL Belt Sanders and other SKIL tools.

"The SKIL Belt Sander does the work *for* you," claims owner Vakoc. "Just start it in motion and guide it. No other sander does so much work with a satin-smooth finish in so little time! We finish more than 2000 board feet in a week's time, a good volume even for stationary tools."

SKIL Belt Sanders for Fast Finishing at Lowest Cost. Best tools for rough or fine sanding. Wide choice of belt sizes and speeds. Light-weight, perfectly balanced with powerful motors.

See Your Distributor for Complete Information or Call Your Nearby SKIL Factory Branch Office

SKIL
PORTABLE TOOLS

Five SKIL Belt Sanders To Meet Every Need

Model	Belt Width	Price
325	2¼"	$ 68.00
448	3"	115.00
449	3" (with vacuum dust collector)	142.50
323	4½"	147.50
324	4½" (with vacuum dust collector)	177.00

Prices and specifications subject to change without notice.

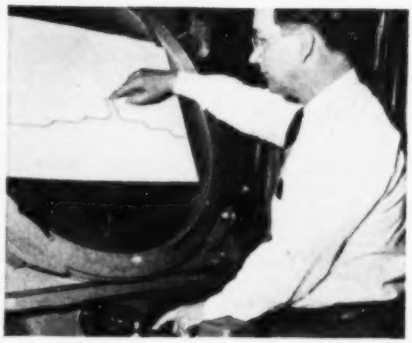
SKIL Products are made only by SKIL Corporation, formerly SKILSAW, Inc., 5033 Elston Avenue, Chicago 30, Illinois
3601 Dundas Street West, Toronto 9, Ontario. Factory Branches in All Leading Cities

Here's why Diehl Cutterheads—known throughout the woodworking industry for their perfect balance and long-life cutting edges—*give perfect profiles.*

To obtain absolute precision of contour, Diehl Cutterheads are tested with modern optical comparators which permit precision measurement against original engineering drawings. The result is exact contour—*you* benefit by getting Cutterheads capable of turning out volume production to exact dimensions.

Contact your nearest Diehl Representative or the Diehl factory—ask for Condensed Cutterhead Catalog—Bulletin No. 452.

CUTTER DIVISION



Diehl expert points to magnified cutterhead contour—projected on screen of comparator.

On the Banks of the Wabash

THE G. M. **Diehl** MACHINE WORKS, INC.

WABASH, INDIANA • U.S.A.

Who Is RESPONSIBLE FOR LOST MARKETS *?*

At the recent F.P.R.S. meeting in Memphis, there seemed to be an undercurrent of feeling that there must be something done to awaken our industry to the crying need for better marketing of wood products. This was put into words by the principal speaker at the annual luncheon. Congressman Harris Ellsworth from Oregon. (His speech appears on page 51.)

There is no doubt that something must be done at once if we are to hold many of our present markets against the inroads of plastics and metals!

To be realistic, we must acknowledge that there are some instances where plastics or metal do a better job. However, in most cases this is not true. With a little investigation, we can prove that wood does a better job! The trouble lies in our being too busy to take time to refute claims made for other materials and the public accepts these claims as facts.

It is unfortunate that there is no organization which covers the entire woodworking industry. If there were, we could probably combat this situation directly. Therefore, it is up to us individually to assume a personal responsibility for the over-all success of the woodworking industry!

As I see the situation at present, three basic things are needed: Honesty on the part of the manufacturers of wood products, being sure the products they make have the qualities they attribute to them; dissemination of correct information about wood products to overcome the wrong information given out by manufacturers who are attempting to claim our markets; and loyalty on the part of each and every one of us, exemplified by the purchase of wood products.

There are many glaring examples of our "selling-out" the woodworking industry. None is more general than in the furniture field—office desks in particular. Wood flooring is another item that is being determinedly fought by other materials.

If we don't know why wood products are better than others, how can we expect the public to know? If we don't buy wood products, how can we expect the public to do so?

Ned Bailey
Editor-in-Chief

ACTUAL PHOTO IN IGLOO CABINET CO., A LEADING TV CABINET MAKER

Production GOES UP
Costs COME DOWN

with **DUO-FAST**
Direct Drive
AIR TACKERS

FAST—Drives 33 staples in 10 seconds.

EASY—Press trigger. Air does the rest.

POWERFUL—Drives into toughest materials.

CONSERVES AIR—Operates on 40 to 125 pounds, depending upon the power needed.

LIGHT—2 pounds. Ideal for women workers.

3-SEC. LOADING—Saves operators time.

12 MODELS—Wide Range of Staple Sizes.

Send for the timesaving, moneysaving facts on Duo-Fast Direct-Drive Air Tackers.

FASTENER CORPORATION 860 FLETCHER ST CHICAGO 14, ILL

☐ Please send information on Duo-Fast Air Tackers.

☐ Also interested in Duo-Fast Manually Operated Tackers

Name of Firm _____

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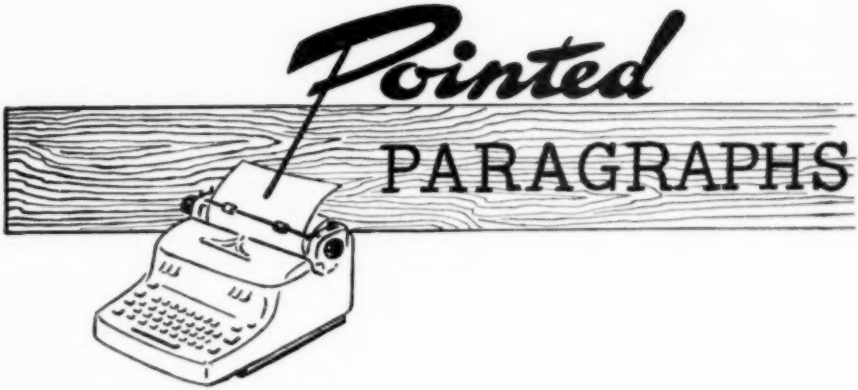

The Timber Engineering Company is sponsoring a five-day course in wood adhesives, gluing and laminating. It will be held August 17-21, at the firm's research laboratory.

The lumber industry is about to launch a million dollar research program designed to cut home building costs and to give consumers new and better lumber products. WOOD WORKING DIGEST will carry a longer report on this in an early issue.

The construction boom in the 37 states east of the Rockies continues to spiral toward a 1953 all-time record in contracts awarded as five month totals gave the current year an 8% edge over 1952.

Douglas Aircraft Company, Inc., Santa Monica, Calif., is now marketing a new product called Aircomb. It is a honeycomb structure of Kraft paper impregnated with a phenolic resin. In use it is sandwiched between thin facings of aluminum, stainless steel, magnesium, wood, plywood, plastics or other materials.

The lumber industry's apathetic attitude to the loss of its markets has been a subject of concern for some time. Our editorial in this issue is directed along these lines. There is a rather successful effort being made to shake off this apathy. This activity has been long delayed, but it is not too late if we all get behind this movement.

Housing research experts are drafting the nation's first formal code of home safety standards to eliminate "built-in hazards" from the home and cut down the shocking toll of 27,500 deaths. Recommendations will

include elimination of curved steps in stairways; setting up minimum standards governing the slope of stairways and limiting the use of lead-base paints.

Concurrent with the 1954 national meeting of the Forest Products Research Society, a full-scale woodworkers' industry show will be held at Grand Rapids, Michigan, next May 5-7. The show will receive full cooperation of the F.P.R.S., but is not society-sponsored.

B. V. Hancock, executive vice-president of the Douglas Fir Plywood Association, told members at a recent meeting that markets for more plywood can be found, but they must be sold.

The Defense Department has been urged by the National Lumber Manufacturers Association to re-examine its plans to buy pre-cut steel military barracks for advance base use. NLMA says that although the use of wood for frames and siding in advance base barracks has been generally rejected since World War II, its members hope a restudy of this market will enable it to win part of this market for wood.

Frank H. Day, president, Kolorwood Ltd., Sault Ste. Marie, Canada, has announced a chemical process for coloring wood in the log. This method allows wood to be colored in many different shades and hues. The process combines centrifugal force with pressure.

Weyerhaeuser Timber Company is shipping logs made of pressed sawdust to Japan to be used as fuel.

Furniture store sales are staying high. It looks like the rest of 1953 will be an exceptionally good year.

Public education on fine woods has been undertaken by a group of importers, converters and craftsmen, banded together to supplement efforts of various industry groups. The campaign is directed against imitations that are passed off as real veneer, genuine hardwood and the like . . . not against the other materials.

The articles in this issue of WOOD WORKING DIGEST bring some good hard sense about industry problems and solutions. We are particularly concerned with effective ways of holding our markets and doing a better job of merchandising. A reader-idea column can be published in an early issue if you let us hear from you. Write to the editor.

These properties of **URAC 185** make it first choice for (1) **Counter tops**—decorative laminates bonded to cabinet. (2) **Kitchen cabinets**—for stronger butt joints, assembly joints. (3) **Hardboard and flush doors**—to insure a sound core. (4) **Dinette tables and benches.** (5), (6), (7) **Chopping blocks . . . laminated chairs . . . wooden pastry boards.** (8) **Edge bonding of laminates.**

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Kitchen bonds must stand up under rough use, moisture and heat. That's why leading manufacturers of fine wood products for America's kitchens choose Cyanamid's URAC Resin 185.

This urea-formaldehyde resin adhesive is gap-filling, craze-resistant, fungicidal. Moisture-resistance tests have shown wood will deteriorate before the URAC 185 bond. It makes one of the strongest possible joints. It's easy to mix, easy to work with (sets at room temperature and low pressure . . . can also be used with strip heating).

Write today for complete information on URAC 185 for assembly gluing, bonding of decorative laminates to plywood or lumber cores, lumber core bonding, bonding of edge veneers, etc.

For the convenience of those who do not require bulk shipments, URAC 185 is

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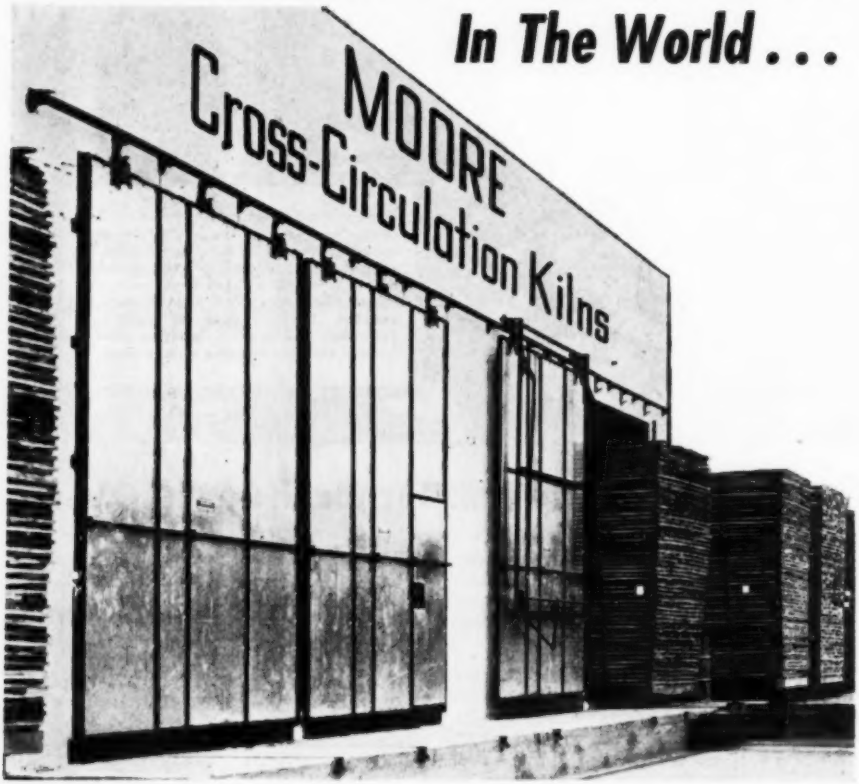

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Comments from THE NATION'S CAPITAL

By Arnold Kruckman
Washington Correspondent

The 12 members of the cedar chest manufacturing industry met on May 28 in Washington, D.C., at the Federal Trade Commission for what undoubtedly was the final hearing on the proposed Trade Practice Rules. Chief Examiner John J. Horton, of the Corporation Division, was in charge. As a result of the facts presented and the arguments advanced the commission, at this time, has virtually decided that those making chests of hardwood shall be eliminated from the cedar chest classification. In effect, only chests made of a certain number of softwoods will come under the rules. It is expected that the complete rules, as confirmed by the Federal Trade Commission, will be promulgated not later than the end of July.

As the result of an overwhelming number of protests, the Navy has announced it will curtail federal manufacture of paint, and will buy most of its needs from private industry. However, unless Congress stops the operation, two Navy paint factories, at Norfolk, Virginia, and Mare Island, California, will continue to manufacture "small quantities" of paint. The industry still objects, even to the small quantities. It is feared this will be used by the Navy again to make all of the paint it requires for all of its operations.

The Navy began to build up one of the largest paint industries in the United States about 50 years ago. The paint manufactured at the two plants was shipped to all parts of the country, where the 1,400 paint makers already have well equipped local establishments. The Navy, as well as hundreds of other departments and agencies of the federal goverment, competes with private industry in many lines. There are almost 2,200 federal government departments and agencies.

The Navy conducts a huge business making clothing, rope, spectacles and a number of other commercial items. No one can

find, either in the budget or in other authorizations, how these government agencies ever got into competition with private business. At the prodding of the American Progress Foundation, Congressman Ralph Gwinn of New York has introduced H.J.R. 123 to adopt an amendment to the Constitution to take the federal government out of competition with private business.

Office of Technical Services, Department of Commerce, announces publication of a microfilm and photostat entitled "Equipment for Lacquer and Varnish Factory" which came from Germany; also, translation of a German paper on vinyl acetate emulsion paints. Both of the publications may be had from the Library of Congress, Publication Board Project, Washington 25, D.C.

Edmund F. Mansure, who as head of the General Services Administration recently became the chief federal housekeeper, has over a half billion dollars to spend this year. He buys everything from pins and paper clips to locomotives and ocean going mercantile ships. His agency, for many other agencies and departments of the federal government, buys enormous quantities of woodworking products. Mansure is now trying to simplify the buying system and reduce the variety of purchases. For instance, he found that furniture manufacturers were asked to bid on 25 different styles of bent wood chairs. Mansure decided that one style is quite ample. He has brought the same kind of simplification in purchases for the needs of more than 5,000 other buildings for which he is housekeeper.

Millions of dollars are being saved annually in a similar manner in the purchase of wood products by the military. Timber Engineering Co., affiliate of the NLMA, is working with the Defense Department. It reports $20 million worth of wood office and household furniture was whittled down to an expenditure of $18 million. In another instance, the military order for 165,000 dining tables was simplified, saving $345,000. The Defense Department is now buying $25 million worth of bedroom furniture, using a specification prepared by Teco, saving over $250,000 on the order. It is estimated military purchases of wood products use up annually more than 100 million board feet of lumber. Teco recommendations work out in a saving of about $25 per thousand feet, or a minimum saving of $2,500,000 per year.

Federal Housing Administration revised its requirements for installing partitions in one- or two-unit dwellings, and now permits clear span roof construction.

U.S. Department of Agriculture announced a leaflet on preventing cracks in new wood floors. This may be had, free, by writing to the U.S. Department of Agriculture, Office of Information, Washington 25, D.C. Also, the department issued a handbook entitled "Preservative Treatment of Wood by Pressure Methods," which may be had by writing the Superintendent of Documents, Government Printing Office, Washington 25, D.C.

Norman H. Reece, former staff architect for the National Academy of Science, is now Building Codes Consultant for NLMA, succeeding Frank H. Alcott, who died last March. Lyall Tracy

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When reduced to chip form by hogging, wood burns more evenly—gets *all* the heat value possible. Unhogged slabs, trimmings, large pieces, restrict air flow, smother fire, result in inefficient combustion.

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Processing wood scrap with a Williams Hog, for resale in the form of wood flour or sawdust, assures more uniform grinding and sizing—much lower labor costs—reduced power requirements.

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One man firing wood in chips can handle the same tonnage as would require three men if fuel scrap remained in awkward lengths and pieces that necessitate individual handling.

4. Your Operation May Permit Complete Automatic Handling

Williams has made many automatic installations to hog and convey waste wood to stoker or boiler at tremendous savings in handling expense. Other installations to automatically grind, separate and package wood flour and sawdust result in phenomenal reductions in cost.

Williams equipment will actually pay for itself in a few months, then continue to produce extra profits for many years. Investigate now!

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CRUSHERS GRINDERS SHREDDERS

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of Aberdeen, Washington, was made deputy administrator of NPA during its closing months. He formerly had been in charge of the Forest Products Bureau. Incidentally, some of the NPA personnel have been transferred to various sections of the Department of Commerce, others will undoubtedly be absorbed by the permanent equivalent for NPA which is being organized by Commerce Secretary Weeks, always assuming Congress will consent with the necessary appropriation.

Harold D. Ellis has been placed in charge of the Harrisburg, Pennsylvania field office of the American Forest Products Industries.

Clair W. Ditchy of Detroit is the new president of the American Institute of Architects. He succeeds vice-president Kenneth E. Wishmeyer of St. Louis, who withdrew on account of illness. Other new officials are Norman J. Schlossman, Chicago; George B. Allison, Los Angeles; Howard Eichenbaum, Little Rock, all of whom are vice-presidents. George Bain Cummings, Binghamton, N.Y., was elected secretary, and Maurice J. Sullivan, Houston, treasurer. New directors are Waldo B. Christenson, Seattle; Raymond S. Kascendieck, Gary; Clyde C. Pearson, Montgomery, Ala.; and Marcellus Wright, Jr., Richmond.

Clayton J. Bruckner, president, Waco Aircraft Company, Troy, Ohio, has invented a tree planter which "beeps" a signal at exact intervals of seven feet, to provide for correct spacing of trees on hardwood plantations.

Howard C. Sullivan, head architect of the Navy's Bureau of Yards and Docks, retired in June after 40 years. He designed the Naval Medical Center at Bethesda, Maryland. He is credited with being the first government architect to adopt modern functional design, eliminating costly gingerbread porticos, etc.

Dr. J. Hugo Kraemer, of NPA Conservation Section for lumber and wood products, has been appointed United Nations reconstruction adviser to the Republic of Korea. Arthur W. Greeley, son of Colonel William B. Greeley, former head of the U.S. Forest Service, has been appointed regional forester for Alaska, succeeding B. Frank Heintzleman appointed governor of Alaska.

RFC announced business loans to Hanel Lumber Co., Inc., Hood River, Ore., $46,000; Dyersburg Tie and Lumber Co., Dyersburg, Tenn., $25,000; Madison Mill and Lumber Co., Madison, Tenn., $5,000; Columbus Floormaster Co., Columbus, Ga., $1,000; Wood Specialty Manufacturing Co., Suwanee, Ga., $169,000.

NLMA has set up a million dollar research project to extend over ten yeyars. It's the largest organized program of its kind in the history of the lumber industry. It will be established by D. B. Frampton, Columbus (Ohio) lumber manufacturer, and 22 members of the NLMA Products and Research Committee. The purpose is to find new uses in home building, and other types of construction, for small pieces of lumber, and wood species which have had little or no commercial value. Also, methods for patching end-splits and other imperfections; to develop a low-cost waterproof glue that sets quickly at room temperature; low-cost preservative treatment that can be applied

See how the new Thermatron High Frequency Generator with Automatic Power Control Speeds up Edge Bonding!

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HIGH FREQUENCY GENERATORS AND EQUIPMENT

In the installation shown, the new 20KW THERMATRON Generator is used in conjunction with a Weldon press, which is completely shielded and guaranteed to meet FCC requirements. A new automatic tuning device delivers to the load the maximum efficiency of the generator

REDUCES PRODUCTION TIME BY 33⅓% AT SENSENICH CORPORATION PLANT!

They agree at the Sensenich Corporation, Lancaster, Pa., that their new 20 KW THERMATRON and batch-type press installation is really the last word for high production edge bonding. THERMATRON'S large power capacity and automatic controls quickly proved themselves in accommodating the wide variety of loads run at the Sensenich plant.

This modern high frequency generator—product of years of Radio Receptor research and development—has indicator lights and meter readings to tell at a glance the exact status of the material in work. Power and tuning automatically adjust to load conditions during the entire cycle . . . and of course all the latest protective devices are included.

THERMATRON engineers are ready to make suggestions regarding your wood-gluing problems . . . Write us now, and request our new brochure No. WD-28.

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to wood before lamination; to perfect lamination of pattern and model stock; to reduce the cost of laminating large structural members; to develop technique for laminating different lumber species in the manner that metal manufacturers have been able to use light and heavy metals.

Twelve European countries sent over 40 experts as guests of MSA in June to study wood conservation and increase of productivity of wood industries. They visited 14 communities from coast to coast. At the same time ten Austrian furniture manufacturers studied all phases of their business in eight different communities of the East, Middle West and South.

Central Trust of China, Division of the USA, 96 Po Ai Road, Taipah, Taiwan, on or before September 15, wants to buy, with MSA funds, some equipment for Formosa logging operations. Information is available in the MSA Office of Small Business, 806 Connecticut Avenue, Washington 25, D.C.

Trade, commercial, and other organizations and groups in all parts of the country have started an avalanche of protests against the announced intention to increase postal rates.

The Federal Housing Administration has fresh authority, totaling $1,750,000,000, to insure loans for the repair and improvement of dwelling units and other structures. The fact obviously is important to the woodworking industries.

Assistant Commissioner Arthur J. Frentz, in charge of Title I Division, stresses that the Title I program, under which the benefits of this huge authorization are bestowed, is essentially a cooperative undertaking in which lending institutions and contractors and dealers play the main part. It is impressive to learn that Chief James Hobbs, of the Dealer Control Unit of FHA, underscores the emphasis that much less than a fraction of 1% of the hundreds of thousands of contractors and dealers who come under the observation and supervision of his unit try to cut corners. Mr. Hobbs says that the good faith and integrity of those with whom FHA does Title I business is a striking illustration of the high standards that prevail among the people in this segment of the economy in the United States.

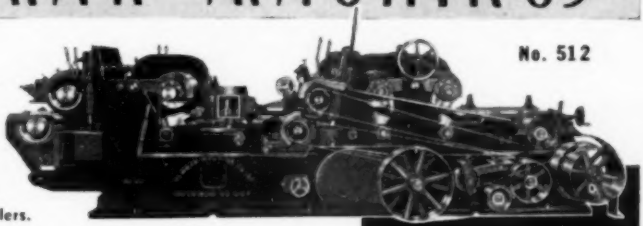
It is suggested these facts about Title I loans be emphasized: Always bear in mind a structure to be improved with the proceeds of a Title I loan must be in existence as a completed building. The repairs, alterations and improvements must be physically attached to the structure so that they become a part of the structure, or are directly connected with it. For example, such additions or alterations as more rooms, stairways, new flooring, and the many other installations and repairs that will suggest themselves, must be replacements or rehabilitation. That doesn't mean they must be exactly the same in kind of type as those they replaced or improved. Apparently the meaning is that they must serve the same purpose, or a similar purpose, as those that went before them.

In the classification of new structures, loans may be insured for the building of non-residential units, such as barns, silos, service buildings, garages, wayside stands, tourist cabins, gasolene stations and commercial or industrial buildings. The enumeration is not inclusive. There are many more kinds of non-residential structures that may be financed with Title I loans.

NEWMAN MACHINES

Newman

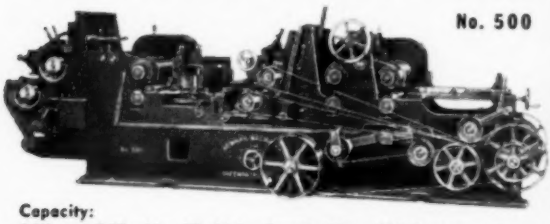
No. 512



Capacity: 16" and 24" wide, 8" thick.
Speeds up to 325 feet per minute.
8" dia. cutting circle.
Six 12" dia. feed rolls.
Single and double profilers.

BALL and ROLLER BEARING PLANERS AND MATCHERS

No. 500



Capacity:
14" and 24" wide, 6" thick. Speeds 40 to 200 feet per minute. 7" cutting circle. Six alloy steel feed rolls. High carbon special alloy steel cylinders. Single or double profilers.

The ball bearing NEWMAN 71 (shown below) will grind all sizes of cutter heads. Table is 33" long by 9" wide with horizontal travel of 25" and is heavily ribbed to maintain accuracy over entire travel. Maximum cutter head swing is 11".

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The NEWMAN 55 feeds stock automatically to high speed planers and matchers up to 450 lineal feet per minute. Capacity: 30" wide, 8" thick. All adjustments and controls are centrally and conveniently located.

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The NEWMAN 8-B planes 22" wide and 8" thick, joints 4" thick and will match 14" wide. 6" diameter feed rolls. Speeds of 30, 50 and 75 feet per minute.

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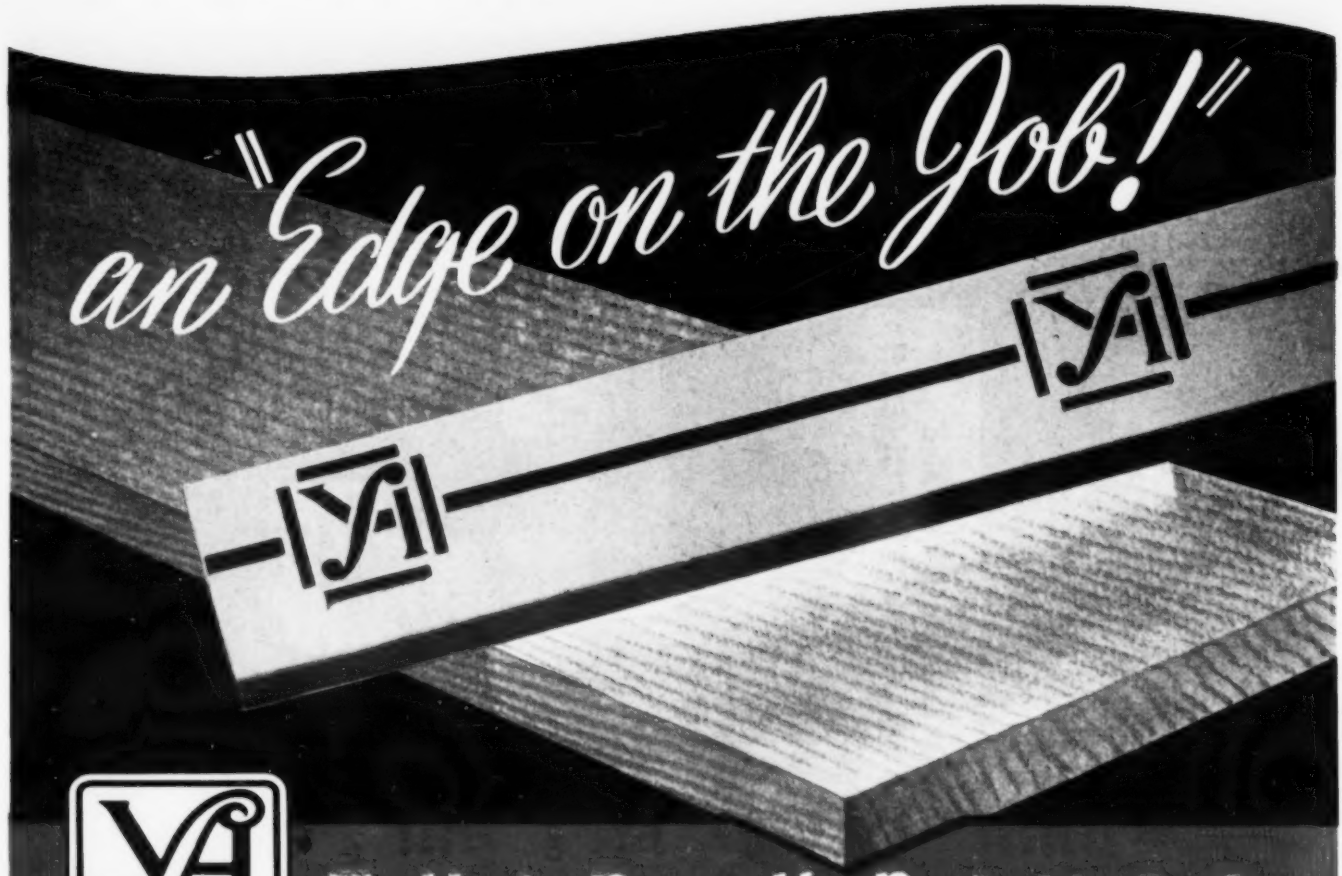
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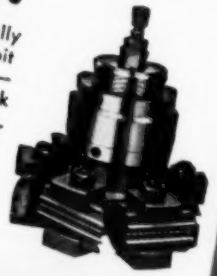

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Research
and the Whole WOOD PILE

By Representative
Harris Ellsworth

Honorable Harris Ellsworth presented the keynote address at the recent F.P.R.S. annual meeting. Spotlighting the necessity for research, he emphasized the current problems of the woodworking industry.

THE inescapable fact is that no matter what product goes out of the shipping room door of industries which depend upon wood as their principal source of raw material, they are all bound together by a common interest: they are all using wood from the same wood pile in the forest! Anything and everything which affects the quantity, the quality, the accessibility and availability of that wood pile is of paramount importance to all such industries.

It seems to me that such a community of interest almost demands a unified approach to and attach upon problems common to wood and the future wood supply, meaning, of course, forest management.

The lumber industry has numerous excellent trade associations based upon species or groups of species in geographical divisions. The plywood industry is organized into its special group. The pulp and paper industry is likewise organized around a single product. Then we have the furniture manufacturers' organizations, the railway tie manufacturers, and so on in special fields.

As I have come to understand the nature and characteristics of the Forest Products Research Society, I am struck by the thought that it may be high time

that the great diversified wood using industry itself take a tip from you and develop another organization along these same lines which could devote itself not only to better production and marketing methods, but to those other four industry essentials—quality, quantity, accessibility and availability of wood. To these four, of course, must be added the long range problem of perpetuation of our wood supply.

Although I am not familiar with the details of its work, it may be that the organization known as American Forest Products Industries, Inc., is that sort of organization.

The largest woodlot owner in our country is the U.S. government. It owns nearly 20% of the nation's wood supply. The laws which govern the management of this great property and the sale of its products are passed by the Congress of the U.S. Naturally, we wish to do the very best job we can for the benefit of all the people.

It has occured to me also that this dependence of the forest products industries upon the common resource, the growth capacity of our forest lands, extends much farther into the interrelationships of manufacturer and distributor than has become apparent in recent years.

There was a time when almost all of the products of the forest went to lumber and fuel, but that is no longer true. Pulp and paper products, for example, are taking about as much wood as was included in the total lumber production of the country 20 years ago and the steady increase in pulp and paper consumption indicates that there is no visible limit to the requirements of our people in this field.

The relative newcomers in the field of fiber products—hardboards, softboards and their various relatives—are increasing in importance at the same time that plywood continues to increase in demand.

Taking just these four products—lumber, paper and pulp, fiberboard and plywood—I have been astonished at the rapid growth of industries using more than one of these basic products in the manufacture of consumer goods. Combinations of paper and plywood, paper and hardboard, paper and veneer, paper and lumber and all the rest of the possible combinations seem to be gaining usefulness and importance in steadily broadening fields. Now this proves to me the validity of the basic concept of the F.P.R.S. that the unification of research effort in forest products is bound to be followed by closer unification and integration of all the multiple units of industry that depend upon wood products.

Long ago, I became thoroughly convinced that the way to have and perpetuate productive forests was to learn to use the forests wisely and well. I also learned that a single product industy, lumber for example, or plywood or pulp and paper, not integrated with other industries was likely to prove destructive of forest values. I have observed with great interest in my own district and elsewhere the development of very large integrated operations dependent upon the research results of the past and the marketing potentiality of the future and it has seemed to me that these were moves very much in the right direction. It has seemed to me also that we do not take advantage of all the manufacturing techniques that we know in order to do a much better job of integration of forest industries.

I know some of the obstacles. Huge capital investments are required in many cases, and in order to get these investments there must be strong assurances that the investors will be able to earn a fair return and liquidate their investment over a definite period of years. Above all, investors must be assured of continued and available supplies of raw materials.

However, it still seems to me that there is too much of a lag between the time research results are obtained in forest products and the time they are put to work. For example, where there are perhaps only a half dozen steel companies that by themselves can use extensive research programs, sales programs and developmental programs, there are, on the other hand, 50,000 or more sawmills or producers of wood

products. There is a vast difference between conducting research in that field and conducting research in steel or aluminum or petroleum whose units are very well financed and well organized. In 1951, for instance, while the lumber industry was investing the meager total of $819,000—3/100 of 1% of its gross product value—in product research, here is what its competive industries were doing.

Chemicals put $204,170,000—or 2.5% of its gross products—into research.

Fabricated metals allocated $38,404,000 —0.9% in products improvement. In addition, primary metal invested $34,415,-000—or 0.4%

I do not believe it will ever be possible to have the basic research in forest products done much differently from the way it is being done now. So I suspect that our main job is to develop ways of putting our research results to work. This does not minimize the absolute necessity of continuing progress in strong and adequate basic forest products research. We must learn more and more about the complexities of wood and its use in a thousand ways.

To point out what I mean by lag between research and application, I am informed for example, that the Forest Products Laboratory developed the semi-chemical pulping process back in 1925 and today this highly efficient process is just getting into large tonnage by many mills. The "Lab" also made laminated bowling pins and laminated ball bats as long as 30 years ago, but they are just now getting into use.

Is that because of economic factors? Is the cause of the final adoption of lamination here the decreasing supply of good clear maple and good clear ash and the economic necessity for making such goods from small trees? I suspect so, but I also suspect that much of the lag was due to inertia on the part of industry itself.

The attention of American industry was called to the possibility of laminating beams, rafters, arches and other construction members as much as 25 years ago, but, only recently have we begun to make real industrial progress. Personally, I think that this field offers tremendous opportunities because it is peculiarly applicable to second growth wood, and it is only a matter of a comparatively few years until all our wood will be second growth. Which brings up another point. The forest products industries have done tremendously well with glued and laminated wood and plywood manufacturing since the chemical industry made the waterproof, durable, synthetic resin glues available, but if we could have cheaper and quicker setting waterproof glues that need only a short assembly time and do not require hot presses, the opportunity for further expansion in the general job of making big pieces out of little ones seems to me to be enormous.

In the field of marketing it seems to me that until very recently the wood industries have been particularly careless and negligent. A little thing came to my attention the other day in "National Hardwood News" that to me shows the difference between the way in which the wood industry and the metal industry go after business.

"Much propaganda has been put out over the years attempting to show the superiority of metal structures and furnishings over wood in the matter of fire safety, but all the arguments in that respect have fallen on deaf ears as far as the Chicago Fire Department is concerned, when it affects their own equipment. The fire commissioner repeatedly put in a requisition for wood ladders, but active opposition from makers of metal ladders forced the

issue to the mayor who insisted that the fire commissioner give him his reasons in writing for favoring the wood ladders so consistently. Here are the reasons he gave:

"1. Firemen could be electrocuted if a metal ladder touched a trolley wire.

"2. Wood does not warp under extreme heat, nor snap under extreme cold as metal sometimes does.

"3. If a wood ladder burns, the danger can be easily seen, whereas metal can buckle suddenly and without warning when overheated.

"4. Wood ladders are easier to repair than metal ones.

"5. In cold weather, firemen's gloves or bare skin freezes and stick to metal ladders if wet.

"As a result wood ladders were ordered without further argument."

Those are the basic facts about the superiority of wood in a lot of uses, but whoever read any of them in a national advertising campaign? You have no trouble finding well-financed advertising extolling the superior qualities of almost anything except wood. It took the old fire chief to champion the cause of wood!

Suppose now that from a layman's point of view we run over together the future of wood as we see it, either in the developmental stage or in the dreaming stage that will become developmental in the near future. In the first place, let's think about wood as a raw material for the engineer who is going to build or manufacture something out of pieces of wood as wood. What have we done, and what do we need to do? Through the efforts of a lot of research men, we know that wood has finally reached a position of some prestige as an engineering material on the basis of predictable strength properties. Actually this status is comparatively recent, and there is still, I am told, a great deal of wood wasted by over-design. We know that we have made excellent progress in recent years in our ability to fabricate designed members—arches, trusses, beams and so on—from wood in such ways that their load bearing capacity and resistance to stresses are pretty accurately predictable.

There are some other tasks that must be done before we can do a really good job in forest management. We must be able to sell all the grades of lumber that come as a product of the cut, and we must be able to sell them at a profit. It seems to me that there are several major avenues along which we can do a better job of using this material in the lower grades. In the first place, we now know how to cut and eliminate the major defects, edge gluing and end gluing the small pieces continuously in such a way that we can come out with high grade boards of any dimension that we want to make. This is being done.

The improvements that can be visualized again are along the lines that I mentioned before. We really need, and need badly, the quick-setting cold, waterproof glue that can do the job and do it well without all the expensive gadgetry that we have to install now. If that glue becomes available, I can predict with some certainty that the field of making big pieces out of little ones, whether it is beams or arches or just flat boards, will become a very important part of the basic forest products industries. But there is more. Recently I have seen some interesting combinations of veneer and paper stock put together with glue that develop extremely important properties from the standpoint of strength and resistance to the give-and-take of moisture. Why can't this idea be expanded to combine paper or thin sheets of hardboards with low grade lumber in order

to give us better usefulness and marketability for our common grades that so often clog the market?

Just in passing, I have been told that one of the obstacles to the fullest possible growth in the laminating field is that we still do not have adequate inspection methods to determine whether we have done a good job of gluing or not. Now that looks to me like a pretty tough job, being able to know without breaking something apart whether you have stuck it together well, but scientists tell me that a way can be found with the application of some good hard research. If it can, it looks to me as if we might have a very important tool.

You know and I know that the basic property of the wood fiber that still plagues all branches of the forest products industries is its propensity to take on and give off moisture, and shrink and swell. You know and I know that we have done a lot of fine work, basic work, in the study of this property, but we still do not have a satisfactory and economically sound process for making shrink-proof wood cheaply. I can dream about a piece of wood that is fire-proof, decay-proof, shrink-proof, and cheap, and possibly, at the same time made out of stuff that we now burn up or throw away. If we could do that, and I think we can, I could feel pretty relaxed about the future of wood consumption in the form of wood itself.

I do not know that we are paying enough attention to just ordinary processing of wood. There must be oportunities for improvement in manufacturing and refinement that should yield to strong research effort. We are using a lot of new combinations of materials that are really challenging our engineers. Therein I see some hope. If we can get away from the idea that we must use lumber or paper or veneer itself and begin to think in terms of putting all kinds of wood products together, to make the most useful goods, I think we shall have made a very important step forward.

Even if we do all these things, there will still remain a very large pile of wood for which we shall have to find uses. One of the most fascinating developments in recent years has been the stripping of the bark from logs ahead of the head saw and then the chipping of the slabs, edgings, and trim into raw materials for pulp mills or fiberboard manufacture. That is good. That is fine. I wish we could have more of it. As a matter of fact, I wish all saw logs could be so treated, and some day perhaps they will be. But even then, notice that we have to start with a saw log. What are we going to do with the logs that are left in the woods because of defects and with the very large volume represented in the tops and limbs? For that matter, what are we going to do with the sawdust that in some parts of this country gets to be quite a problem

I have been, for some years, very much interested in research developments working toward the use of this pile of wood as a chemical engineering raw material. I am thoroughly convinced that in the long run we shall make chemical goods economically from that part of the forest crop now considered irretrievable waste. I am certain that research efforts in this field will repay itself many times over, because there is no segment of the whole forest enterprise so troublesome as the utilization at a profit of that enormous wasted sawdust pile.

I have been very much pleased in recent years to see the expansion of developmental research by some of the larger private organizations in forest products. I have been greatly pleased to see some of the states take up part of

the burden of responsibility in the research field. I am not satisfied by any means that the research effort has more than begun. I feel that it is grossly inadequate. The federal government long ago wisely recognized the necessity of continuing research in the forest products field, and the leadership of the Forest Products Laboratory has been powerful and influential. I want to see it continued and I want to see the fundamental research effort of the federal government continued and expanded, because I know that only on a basis of well organized continuous research of a fundamental nature can we ever hope to achieve better development in forest products utilization.

Finally, I am fascinated by the challenge of the problems which surround the growing, the production and the marketing of wood. There is more opportunity for constructive accomplishment in better forest management, forest products research and wood marketing than there is in any other industry on earth!

There is so much to be done! I know that some better legislation is needed not only at the federal level, but in the states. We all must be aware that in the eternal battle for markets in our free economy, wood, generally speaking, is taking a beating and in far too many categories is being pushed aside by products which, if not quite so good, are being better merchandised.

F.P.R.S. ANNUAL MEETING

Some 400 members of the Forest Products Research Society met in Memphis, June 15-17, for the seventh annual meeting of the organization. Three days of technical sessions and tours to local manufacturing operations proved most worthwhile.

Honorable Harris Ellsworth (Rep. Ore.), formerly a timber man, spoke to the group at its annual luncheon. His speech begins on page 51 of this issue.

Robert D. Pauley, new president, and Kenneth Chesley, retiring president, as they appeared at the annual luncheon of the Forest Products Research Society.

The annual luncheon also served as an occasion to introduce Robert D. Pauley of the Weyerhaeuser Timber Co., Tacoma, Wash., who is the new president for the group. Lester J. Carr of the L. J. Carr Co., Sacramento, Calif., is president-elect and Moss Christian of the Chicago Mill & Lumber Co., Chicago is now vice-president.

The Paul Bunyan cocktail hour was also held, followed by the convention banquet. All of the meetings were held at the Peabody Hotel in Memphis.

Grand Rapids, Michigan, has been selected for the 1954 meeting which will be held early in May.

PERFECT SHIPPING

The spring-summer issue of the Signode Steel Strapping Company's house organ is specifically devoted to the subject of perfect shipping. "Seal" features articles by important figures in the Association of American Railroads. A complete cross section of packaging and shipping protection methods is shown. One section of the magazine is given over to loading methods that stop loss and damage in transit for shippers of all types of products. The entire magazine should prove helpful to all shippers.

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A Shimer Cutter Head has many extra value features that pay EXTRA DIVIDENDS all along the line

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Shimer Vise Grip Heads are made from premium steel forgings of open hearth quality, long known for their strength and service; designed for consistent uniformity; uniformly balanced for vibration-free operation.

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Shimer milled-to-pattern bits cut evenly, wear evenly without pattern distortion . . . are easy, quick to sharpen. Quality work is the purpose and the accomplishment! Vise-grip seating of bits on a well balanced head spells safety to the operator and uninterrupted production speed to the mill.

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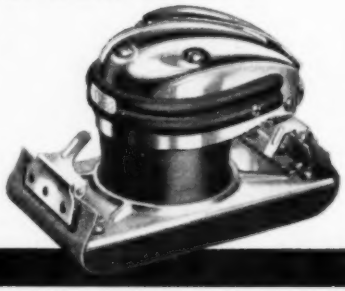

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National offers a complete line of air or electric driven sanders with both orbital and straight line action. If you want to increase production while doing a better finishing job, see your National jobber.

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THE CHICAGO *Summer Market*

By E. McDaniel

LET'S emphasize the human aspect of furniture design and manufacture! This was the theme of the speeches presented at the trade press luncheon on the first day of the Chicago Furniture Market, June 22. Elizabeth Gordon, editor of "House Beautiful," who had already expressed her concern with "sterile" design and architecture in her April issue, told the group that "totalitarian, sterile, abstract, almost geometric stylization in design and architecture" needs to be replaced with "revived emphasis on human values."

"Such a premium has been put on novelty that it has become a value in itself," said Miss Gordon.

Her own criterion includes three points: function, structure and beauty. Does it perform well? Will it hold up? Is it beautiful?

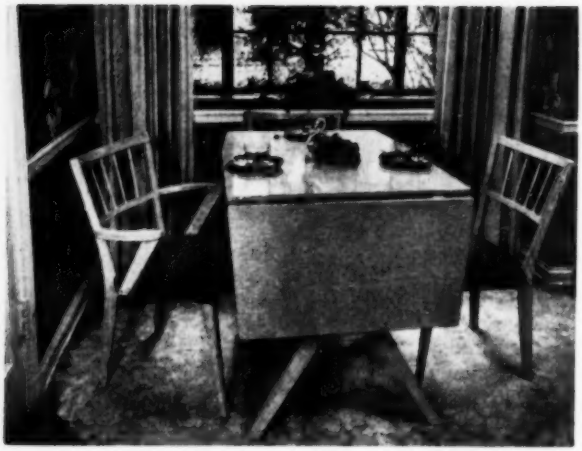
Another one of the speakers, Edith Brazwell Evans, editor in chief of "Living For Young Homemakers," identified common denominators for furniture manufacturers. Unfortunately, there is no way of taking style temperature or the buying pulse of prospective customers. However, from her editorial experience she outlined several factors that furniture designers and manufacturers would do well to take into consideration.

First of these is style. Style is the most important factor in the sale of most home goods. Miss Evans pointed out that today we have more interest in the home than we have ever had before. Being in the home and having it seen by more people makes it inevitable that style awareness flourishes.

Utility and color are common denominators that must be considered with style. Utility has been so stressed that every simple piece of furniture is expected to claim hot and cold running window shades. Customers want versatility. At least 46% are using single and double dressers in living and dining rooms.

Color is the greatest stimulant known. Color goes hand in hand with style. We talk about nature's colors, but nature is the most flamboyant colorist in the world. Nature proves there are no bad colors—it is only the way we relate them. Lacquered and enameled finishes were always hazardous in furniture because of chipping and scarring in shipping and handling, but the magnificent range of colors in stains opens up a whole new vista in colored furniture. It's time to start thinking about it!

Price is the common denominator given as the second most important factor by a majority of stores—and by 76% of the customers. It must be disheartening to manufacturers whose pride in their design leadership is greater than their production, to have their brains and talents skimmed off with large commercial benefits for others than themselves. Can style and design leaders—limited by costs and production facilities—serve as a style barometer for larger producers? A good, inexpensive copy should not diminish the value or desirability of the original.



Junior dining group shows the trend toward blending of modern and contemporary.

It is time for the maker of medium and lower priced merchandise to spend more than he ever has on design and research.

Last among these common denominators is timing. Timing can be set, to a large degree, by careful tabulation of present taste and buying patterns—in our own industry—and all others that influence the attitudes of the consumer.

New About the Market

Greater simplicity, lighter scaling, greater function blended with the best forms and ideas of the traditional to characterize the 1953 summer market.

Among the new numbers were: a TV chair which combined magazine rack and table for phone, snacks or cocktail; a three-drawer desk with bookcase back of genuine mahogany; new tables for picture windows; a student and desk combination gossip bench and step table. The step table had a reversible drawer which could be positioned to open from either side of the table. One attractive corner table included a drawer and a built-in planter area.

The Williams Furniture Company showed a new grouping in Canadian birch and solid maple. There was an interesting china cabinet with a drawer which pulled out for use as a serving tray—this idea came from one of the company's foremen.

The Lane Company introduced several new cedar chest models resembling really handsome television consoles. A variety was offered in drawer treatment to include "secret" ones hardly visible to the eye.

The Mengel Company displayed a new line—"Rambler group." Pieces can be used separately or in interesting continuous wall groupings, including functional wardrobe, double dresser, combination dressing table and desk, vanity and headboard bookcase. The frosted oak finish is attractive.

The Booth Company showed a telephone table chatter bench in maple and walnut combination with wrought iron legs. Booth also used a new type finish for bedroom furniture. It is Plextone, textured plastic finish heretofore used only in juvenile lines.

The Bissman Furniture Company was

showing a new line—Pilgrim Hall which features carved wooden drawer pulls.

The Springfield Furniture Works showed a single pedestal kneehole desk in modern design, new buffet and hutch-type china cabinet and attractive modern drum type tables in cherry mahogany finish.

The Heywood-Wakefield display included a room divider in solid birch which has storage space for china on the dining side and bookcase shelves on the reverse side. For those wanting a higher piece, a top is available.

The Union City Chair Company introduced a full line of unpainted chairs —Windsor chairs, captain's chairs, Boston rockers, high chairs and juvenile chairs.

Solid maple was big news from the S. R. Hungerford Company. After building a reputation with solid mahogany case goods, this manufacturer is branching out into maple with new lines and a fresh viewpoint. These are seen in two new patterns—"Bracket-Foot" and Queen Anne. Distinguishing feature of the "Bracket-Foot" is a heavy base rail on the case pieces.

This cocktail table is of "enchanted" walnut. Crystal sheet glass insert is used for the top. The tapered ferrule and shelf supports are of satin finished solid brass.

This popular priced imported Danish chair was shown at the 1953 market in Chicago. Teakwood is used on the seat and back, as well as the "boots" of the legs. The frame is of Danish beech.

The Sieling Furniture Company showed a new mahogany bedroom grouping in bone white finish with pecan bark walnut trim, slim sculptured legs and a deep groove running around the case near the top.

The Lexington Chair Company's new line attracted a good deal of interest. There are 47 pieces made of Paldao wood and white ash legs.

Kling Factories showed a new dresser which had a section in the center with a rod for hanging sweaters, blouses, etc. Shelves could also be inserted in this space.

An innovation in hardware is the pewter being used by American of Martinsville for its mahogany bedroom and dining room pieces. This firm also featured a bed with 100" headboard in blond mahogany.

Ingenuity in design was displayed in Saginaw Furniture Shops' expanding

Wood used in this room divider are solid walnut and natural birch. These room dividers continue to be very popular.

tables. One of these contains within itself six folding chairs. This marks the first instance in which seating and serving facilities are offered in one compact unit.

The Sales Picture

When sales are coming good, that is the time to keep on pushing sales!

Word from both the Grand Rapids and High Point areas indicates that sales are good and should continue that way. High Point manufacturers believe that sales for 1953 will equal and may top those of 1952. The first six months of 1953 found plants in the High Point area working overtime.

It is too early, as this article is written, to judge results at the Chicago market. However, selective buying was expected to be the key to the market pattern. The next six months were expected to be a tougher selling period.

That's how the industry views the six months ahead. To the alert manufacturer this phrase carries with it a challenge—a challenge for the manufacturer to produce better merchandise at better prices. To the dealer, it means better selling, better advertising, better displays will be necessary to get the home goods share of the consumer dollar.

The National Wholesale Furniture Association heard at its annual meeting that 1953 could look for their best year in history. The outlook is predicated on actual records of achievement for the first five months of the year. Five month shipments were up 9.72% and sales through May were up 7.45%, association figures showed.

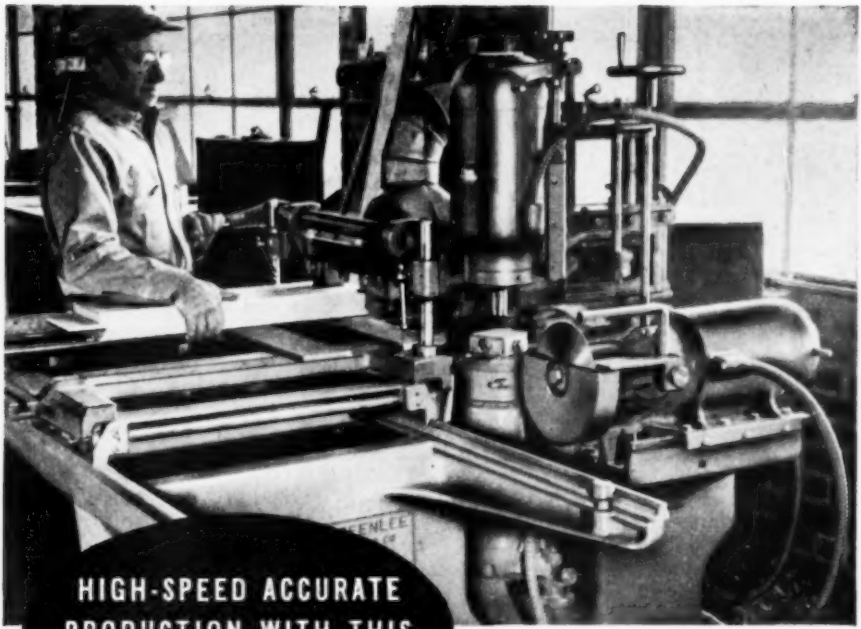
A roundtable of comments from exhibitors at the American Furniture Mart shows that consensus is that the outlook is decidedly favorable for those who sell aggressively under new competitive conditions. Here is what some of them had to say.

"We have always been known as a nation of salesmen and now we've got to earn that title all over again. I do not think it is an exaggeration to say that much of the responsibility for the continued well-being of our economy now rests with us who make up the selling apparatus—the factory sales divisions, the distributor organizations, and the retailers who make final contact with the public." **H. C. Bonfig,** vice-president, **Zenith Radio Corp.**

"We see no reason why the Fall of 1953 will not be one of the best in our history." . . . **C. A. Moore,** sales manager, **Cavalier Corp.**

"Business will be good but we will have to work for it. We will have to offer greater values than ever before." . . . **E. L. Tompkins,** sales manager, **Walnut Wood Carving Co.**

"We are opposed to 'Peace Mongers,' people who go around preaching that business is going to 'Hades' if war in Korea should suddenly end. We think that business will be good for those who



HIGH-SPEED ACCURATE PRODUCTION WITH THIS COMPACT, RUGGED UNIT

. . . Greenlee No. 532 Single-End Tenoner

Here is a husky, highly-efficient Tenoner that makes a little bit of floor space pay off in a big way.

Its special, compact design provides correct table travel on tracks that are relatively short. Thus, it is easy to accommodate this Tenoner in practically any production line . . . and it is easy to operate because everything is so close at hand.

Carefully grouped controls and adjustment mechanisms are readily accessible from the normal operating position. That means quick set-up, fast handling of work.

Rugged construction is another big reason why you find so many firms using the Greenlee No. 532 today. Total weight is 2300 pounds to make this Tenoner extra-smooth running . . . it "stays put" on its settings and stands up to hard, fast scheduling.

In all, you'll find the Greenlee No. 532 Single-End Tenoner a mighty good means for streamlining the production line . . . increasing the speed and accuracy of production . . . and making sure that you can look forward to long years of precise, trouble-free performance.

Write today for Bulletin No. 532 with complete specifications. Greenlee Bros & Co., 2137 Herbert Ave., Rockford, Illinois.

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GREENLEE WOODWORKING MACHINERY: MORTISERS • BORERS • SAWS • TENONERS • PLANERS • SHAPERS • MORTISING & BORING TOOLS

A brunch table with stacking tools is a feature of the Warner Cleveland line. Antiqued iron pulls and hinges require no polishing. The desert sand finish does not show dust or fingerprints.

come out with new styles, good quality, and price their merchandise reasonably." . . . **William J. Mellor,** director of industrial and public relations, **S. R. Hungerford Co.**

"We are of the opinion that the balance of 1953 will be good, however, continual promotion and two-fisted selling is needed to get the consuming public in a furniture buying mood. We feel that progressive merchants and manufacturers who have such a policy in their program will wind up this year in good order." . . . **Robert K. Dillon,** president, **Showers Brothers Company.**

"Current situation better than ever experienced. Expect it to continue." . . . **Bernard Uline,** treasurer, **Nappanee Lumber & Mfg. Co.**

"Business for the first six periods of 1953 for our nursery furniture division has far exceeded our expectations and has outstripped our productive capacity. We are immediately proceeding with additional expansion of our facilities in order to give our market better service." . . . **R. G. Halversen,** vice president in charge of sales, **Hamilton Mfg. Co.**

Next month we shall give a summary of the Chicago Market. At this time it does look to be an indication of good business ahead for every manufacturer and dealer who will prepare for good business and sell aggressively.

HOW TO BUILD A GARAGE

This book—helpful for a home garage-building project, is published by Popular Mechanics Press, 200 E. Ontario St., Chicago, Ill., and is available for $3.50.

"How to Build Your Own Garage," by Wayne C. Leckey shows many different types of garages. Each phase of garage construction has been broken down into several steps so that each becomes a separate, easily mastered job in itself. The book starts the garage builder on the ground and helps him all the way through to shingling the roof. There is a chapter showing the various ways to dress up the outside with a cupola, shutters and window boxes. Another pictures how to provide storage units to keep the interior shipshape. A garage design is given for a built-in atomic bomb shelter which doubles as a fruit cellar! Another plan includes a small greenhouse.

Perkins is headquarters for HIGH FREQUENCY GLUES

The excellence of high frequency equipment for many operations is a proven fact. If you aren't getting the best possible results, it may be that you do not have the proper glue formulation. This can easily be determined through a free and unbiased investigation by the High Frequency Section of the Perkins Technical Service Division.

Since Perkins Glue Company offers five different formulations for use with high solids liquid urea resins, plus several others for use with low solids resin and powdered resins, you can be sure that the glue-catalyst offered you will be best for your operation.

Whether you now have high frequency equipment or are thinking about trying it, return the coupon below for Perkins Summary of Adhesive Combinations for perpendicular, parallel and stray field heating. It's a step in the right direction!

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How Weyerhaeuser wood parts helped increase production without added space or personnel

This nursery chair is the firm's leading item.

● The Holmquist-Swanson Company of Chicago is a leading maker of wood nursery chairs and play pens. As demand grew, they increased production without adding expensive storage or factory space, or more men and machines, simply by purchasing Weyerhaeuser pre-cut wood parts for about 80% of their production.

Naturally, lower unit costs and less waste mean more profit for any company. It can work the same way for you... write now for full information.

Cut-to-size blanks from Weyerhaeuser save storage space, eliminate waste. Compact bundles are easy to handle.

Many parts are supplied by Weyerhaeuser already run lengthwise to pattern, requiring less processing.

Weyerhaeuser Sales Company

Industrial Wood Parts Department

ROOM 2146 • 400 WEST MADISON • CHICAGO, ILLINOIS

From HANDMADE to MASS PRODUCED *Wood Furniture*

By N. C. Brown

FURNITURE, because of its long history, intimate association with daily living and personal comfort, enjoys a position of human interest transcending that of any other product of our expanding machine age. Its use and manufacture over the past century indeed have symbolized and mirrored the mechanical developments and industrial progress of this country. Throughout this century, we have witnessed many changes in structural design, attractiveness, use of varied woods, manufacturing and assembling methods, and in volume of output in step with our expanding population and national income. This past century has progressively produced better designed, more durably built and certainly more attractive furniture than the general public has ever heretofore been able to own and enjoy.

American inventive and mechanical genius has contributed in no small part to the panorama of events from the artistic master craftsmen who took such personal pride in the handmade furniture of 1850 to the precision made and mass produced but altogether better, more usable and universally enjoyable furniture of 1953. Just take a look in some of the 1,400,000 homes built in the last few years to visualize the comfortable, livable and attractive furniture that graces our living, bed and dining rooms as well as our kitchens, dinettes, dens, studies and libraries.

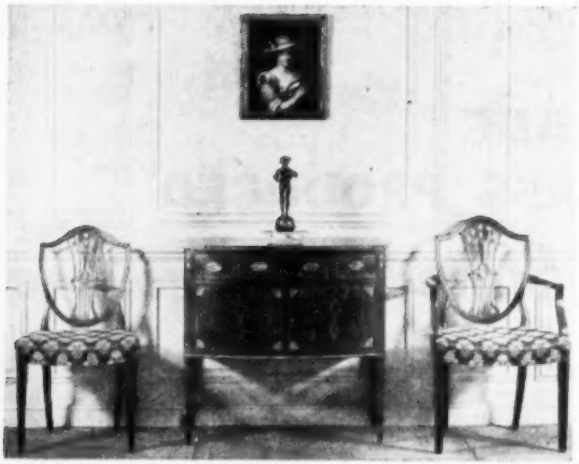
The furniture business is a two billion dollar industry—and today it represents about three times the values of 1939 and involves 2 billion board feet of lumber.

Starting in 1850 with a few small shops employing from 5 to 10 men or more mostly located in the eastern states, the annual production of furniture reached a total of only a few million dollars. In 1950 the leading states in values of wood household furniture (not including upholstered or other household furniture) were as follows:

States	Value
1. North Carolina	$157,534,000
2. Indiana	130,776,000
3. Virginia	105,377,000
4. Illinois	73,553,000
5. New York	71,222,000
6. Pennsylvania	65,900,000
7. Michigan	52,585,000
8. California	37,415,000
9. Kentucky	33,037,000
10. Massachusetts	32,734,000
Total—10 states	$769,133,000
Total—all other states	217,520,000
Grand Total	$986,653,000

Including all household furniture and bedding products, the total value in 1950 was $2,144,000,000.

The 535 largest producers of furniture in 1950 had each an annual value of shipments of one million dollars or



Sheraton mahogany bow-front commode, inlaid with satinwood, ebony and light mahogany. The chairs are Heppelwhite, typical of the late 1700's.

Courtesy Mahogany Association

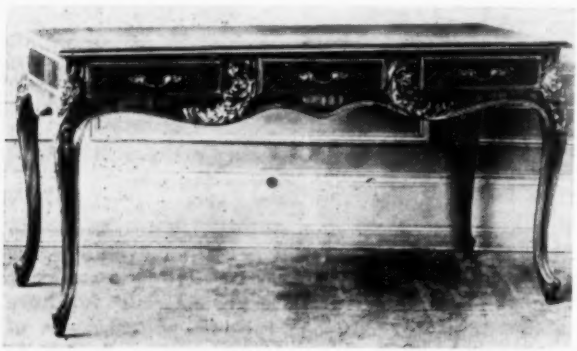
more. The total number of plants was 3,343. Hardwoods constitute about 80% and softwoods 20% of the total volume of wood used. A relatively new industry that has come actively in the furniture industry especially during the past 20 years, has been hardwood dimension, of which more than 350 million board feet or its equivalent are annually consumed.

Classification of Materials

There are several classifications of furniture as to materials used, including wood, metals, fiber, plastics, etc. There are also classifications as to use. The principal uses of furniture may be classified as follows. About 80% of all furniture is for household purposes and classified as such. Wood comprises about 80% to 90% of all materials used for household furniture. Therefore this article deals principally with living room and library types, which comprise more than 33% of all household furniture; bedroom types, which comprise about 20%; dining room pieces, 10%; kitchen types, 4%; porch, lawn, camp and hall types, 2%; and the balance of 31%.

The Furniture Industry in 1850

The fundamental expression of art in the manufacture of furniture as we



Louis XV table of mahogany. Top and drawer panels are of rose wood.

Courtesy Mahogany Association

knew it in 1850 was developed by a series of notable master craftsmen in England in the last half of the 18th century. In chronological sequence these names stand out: Thomas Chippendale, 1718-1779; Robert Adam, 1728-1792 and his brothers; George Hepplewhite, 1720-1786, and his wife, Alice; and finally Thomas Sheraton, 1751-1806. Each of these masters has enjoyed an enthusiastic following and left an imprint on modern reproductions and styles.

Most of these names antedated the development of the distinguished early American masters but they, nevertheless, exerted a great and fundamental influence on what are now prized as antiques of the finest excellence of the art of furniture manufacture. Some of the early American masters, such as John Goddard, Jonathan Gostelowe, Matthew Egerton and his son, and notably Duncan Phyfe, who died in 1854, set the pattern for the foundations of

Courtesy Mahogany Association

Duncan Phyfe chair, typical of the early 1800's. Phyfe was the first outstanding furniture designer in America, 1768-1854.

the great American furniture industry. Philadelphia and vicinity probably turned out more of the early and recognized masters than any other center, although New England, New York and many sections of the south, notably Charleston, played important parts.

Courtesy Mahogany Association

Chippendale chair, typical of the middle 1700's. He was a fashionable cabinetmaker who refined the Queen Anne, and also followed Gothic, Chinese and French motifs.

A poor immigrant boy, Duncan Phyfe, quickly became recognized while still in his 30's as a genius in design, a truly great artist and a successful business man. Contrasted with some more recent furniture manufacturers, he did not sell his product too cheaply. He continued his love of furniture making to an advanced age, dying at 86 and having amassed an estate of more than a half million dollars—a really great fortune for those early days. He specialized in the finest quality of Santo Domingan and Cuban mahogany, and paid as high as a thousand dollars for a single log.

Changes of styles and popular interest in various woods and patterns have distinguished the first 50 years following 1852. Many will recall the Elizabethan types, the garish and rococo designs preceding the "Gay Nineties," and the

Courtesy Mahogany Association

This Palmer lowboy is a reproduction of one of the famous Chippendale pieces in the Metropolitan Museum of Art.

sturdy Mission oak types that developed about 40 to 50 years ago. Mahogany, walnut and cherry have been the traditional outstanding cabinet woods during the formative years of this past century. They still maintain their high place of quality woods. Each has had its popular vogue and together with maple, birch and red gum, have enjoyed their turn in popular favor for fine furniture.

For the cheaper forms, white pine played an important part, particularly in the formative years of the Pennsylvania Dutch sections. Beech and elm and some other woods have entered prominently in the bentwood and kitchen types of chairs.

From the earliest Colonial time mahogany, already having attained great popularity in England and Continental Europe, was in great favor along the Atlantic seaboard. Much of our finest early furniture was imported from England. Low cost water transport was an important factor in bringing in mahogany from the West Indies, during the entire 19th century. Concurrently, the local black cherry of New England, New York and the Appalachian mountains came into great favor as a high grade cabinet and furniture wood. With the western expansion and discovery of the magnificent stands of black walnut in Indiana, Ohio, Illinois and Kentucky and the recognition of its outstanding features of beauty of grain, seasoning qualities, hardness and workability, this wood came into wide-spread popularity for some of the finest examples of art in fine furniture.

These three woods have set the standard for quality products. During the past 50 years hard maple and birch have reached great popularity. The demand for natural finishes has brought in white pine, ponderosa pine, white ash, southern pine, Douglas fir, as well as birch, maple and red gum for many homes, particularly the smaller dwellings of the Cape Cod and ranch types that have been built in such enormous quantities in all parts of the country since 1945.

Wood Used for Furniture

The United States is exceptionally fortunate in possessing a wide variety of woods adaptable to every phase of furniture manufacture. Whether for beautiful effects of veneered or solid wood faces, core stock, bentwood, carving, inlay, etc., from the highest grade quality products to the cheaper varieties of kitchen, lawn, outdoor and porch types and crating.

Every technical property, such as workability, attractive grain and finish, durability, hardness strength, seasoning and finishing properties, machinability, and other specialized features, are found in the woods of the native American forests. These indigenous woods have been amplified by many outstanding exotic woods, chief of which have been the traditional mahogany with many other species such as satinwood, cativo,

Lumber used for furniture, by kind of wood and specified years, 1928-48
(In million board feet)

Kind of Wood	1928 Volume	1928 Per Cent	1948 Volume	1948 Per Cent
Yellow poplar	110	8.7	332	17.0
Sweetgum	408	32.4	300	15.4
Maple	91	7.2	219	11.2
Oak	143	11.4	210	10.8
Birch	107	8.5	131	6.7
Ponderosa pine	4	.3	93	4.8
Tupelo, black and water	55	4.4	92	4.7
Beech	39	3.1	57	2.9
Ash	14	1.1	48	2.5
Southern yellow pine	12	1.0	44	2.3
Douglas fir	10	.8	44	2.3
Alder	18	1.4	31	1.6
Elm	27	2.2	31	1.6
Mahogany	33	2.6	31	1.6
Magnolia	*	....	30	1.5
Spruce	8	.6	29	1.5
Western Hemlock	3	.3	27	1.4
Eastern white pine	14	.3	25	1.3
Eastern red cedar	14	1.1	21	1.1
Miscellaneous (Including Redwood, Sycamore, Cherry, Chestnut, Walnut and all other)	159	12.6	153	7.8
Total	1,259	100.0	1,948	100.0

* Included in yellow poplar.
‡ Includes western white pine.

States using largest volumes of wood including lumber, veneers, and bolts for furniture by specified years, 1928-48
(In million board feet)*

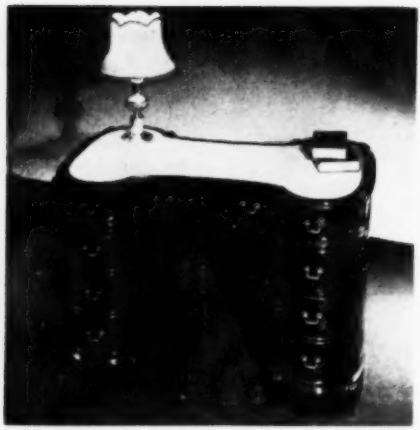
State	1928 Volume	1928 Per Cent	1948 Volume	1948 Per Cent
North Carolina	205	15.0	370	17.3
New York	115	8.4	205	9.6
Virginia	95	7.0	161	7.5
California	31	2.3	119	5.6
Indiana	160	11.7	116	5.4
Illinois	111	8.1	105	4.9
Tennessee	52	3.8	98	4.6
Washington	15	1.1	92	4.3
Pennsylvania	79	5.8	91	4.2
Massachusetts	42	3.1	86	4.0
Michigan	124	9.1	85	4.0
Wisconsin	75	5.5	65	3.0
Ohio	49	3.6	64	3.0
Georgia	16	1.2	44	2.1
Kentucky	29	2.1	44	2.1
Oregon	22	1.6	39	1.8
All others	144	10.6	354	16.6
Total	1,364	100.0	2,138	100.0

* Including veneer in square feet, one-inch equivalent and bolts in lumber equivalent.

obeche, Philippine mahogany, teak and ebony.

The latest government figures indicate that in 1948 there was a record consumption of 2,138 million board feet. Of this amount 91% was lumber, 8% veneers or plywood, and 1% in the form of bolts. This compares with 1,364 million board feet in 1928 and only 748 million board feet in 1933. The quantity of wood used for furniture is definitely increasing in spite of the modern practice of using metals, glass, plastics, fibers and others for many furniture items.

These proportions have changed relatively little over a period of 20 years although there is some increase in the proportion of veneers used. Moreover, the various species have changed very little during that time. Over a longer period of 100 years, there have been marked changes in the species used, just as there have been important changes in public esteem for period reproductions and modern furniture.



Courtesy Mahogany Association

Unusual in shape, is this modified kidney Chippendale kneehole desk.

The most important kinds of lumber in order of volume used for furniture in 1948 are shown in the tables appearing elsewhere in this article.

Chestnut, yellow poplar, basswood, Philippine mahogany and some of the pines are widely used for core stock. About 15% of lumber used is for crating purposes for which the cheaper woods and lower grades are used.

From the figures in the table, it is patently obvious that the demands for wood furniture are increasing. These demands are intimately related to: (1) periods of dwelling construction activity; (2) years following depressions and wars; (3) population increase.

Although wood imports for furniture have increased in recent years, and they are welcome, it is believed that with better forest fire protection and improved timber management policies on the part of both governmental and privately-owned timber, the great bulk of wood needed for furniture will continue to come from our native American forests. The percentage of the better grades and larger clear sizes of lumber will decrease with increasing use of second growth timber. However, with the increased availability of veneers, the use of Milpak (cuttings from the lower grades of hardwoods), the use of character marked woods such as knotty pine, pecky cypress, wormy oak and chestnut, sapwood interspersed with heartwoods, heretofore sometimes regarded as perhaps defective or undesirable, there will be sufficient supplies of raw materials. Certainly we will have to pay for our lumber what it costs to produce it in the years to come. The Augustinian days of prime virgin timber are gone—and gone forever—in the great hardwood forests of the east.

Wood as a basic raw material is too deeply rooted in the American tradition for any other material to ever seriously displace it. It has so many desirable advantages of warmth in appearance and to touch, beauty and attractiveness in so many different forms, together with workability and availability, compared with other materials that centuries of intimate living with it have failed to find any satisfactory substitute.

Furthermore, densified or modified wood has come onto the market, super-

Courtesy Mahogany Association

Rolled edge Sheraton lamp table.

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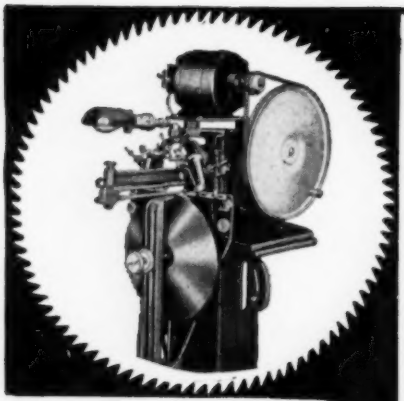

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induced by the strong demand for specialized war purposes, and still later for table and desk tops, chair, table and desk legs, and many other forms of furniture where a hard, dense and durable surface is required. Although not in great volume production as yet, densified forms of wood give much promise for the future. Also compressed chips, sawdust and hogged material from sawmills and woodworking plants formerly wasted or disposed in burners are being converted into slabs and used for core stock in kitchen and other cabinets, for doors used in furniture, and for other forms as exemplified by "Prespine," developed in Clinton, Iowa; and "Pressed-Wood," in Gardner, Massachusetts.

Advantages of Wood
As a Furniture Material

These may be summarized as follows:

1. Wood is available in so many diverse properties, such as color, grain, hardness, workability, bending qualities, strength for weight, etc., to satisfy every demand of the furniture manufacturer.

2. It is easily workable by hand or machine and lends itself admirably to shaping, gluing of joints, inlaying, carving and other aesthetic treatments.

3. It is relatively inexpensive as compared with other materials.

4. Parts may be efficiently joined and held together with various agents such as glues, screws, nails, dowels and other devices.

5. It is a relatively poor conductor of heat, therefore warm to the touch as well as in appearance.

6. It possesses beauty of figure, color and grain not matched by any other material. These properties lend themselves admirably to a wide variety of finishing which present most attractive appearance in the final forms. Attempts to satisfactorily imitate the color, grain and finish of wood in other materials

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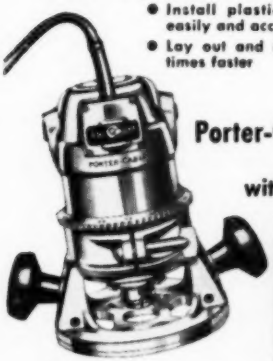

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such as railway sleeping cars, desks, cabinets, etc., have failed in popular esteem. Moreover the natural beauty of wood is enhanced with age, noticeably in cherry, walnut and mahogany.

7. A permanent available supply of wood, both from domestic and foreign sources, is assured.

8. A deeply-seated and well-founded tradition in favor of wood which is not easily displaced by new and untried materials.

Limitations in the Use of Wood

When green and during the seasoning process, wood is susceptible to warping, shrinking, twisting, honeycombing, and other features which may degrade it or render it unsuitable for furniture purposes. Even when relatively dry, wood may shrink or swell, depending upon the atmospheric moisture and temperature in which the wood is stored. Most of the problems associated with seasoning wood have been solved through scientific kiln drying. Although wood is a very common and widely used material, it is still little understood by those who may be working with it. After proper kiln drying to a moisture content for proper storage or in the condition in which it will be finally used, all surfaces of wood must be properly treated with protective and adequate finishes.

Changes Due to Growth And Relocation of Industry

Throughout the past century there has been a gradual development from the small handcraft shops making a few pieces of furniture per month to the larger establishments making thousands of finished pieces per month, finally to many of our great American plants each producing more than $1,000,000 worth per year. After the Civil War and notably during the period of 1870 to 1890 there was a marked expansion in the furniture business. With the intro-

duction and use of veneers and plywoods, much of our furniture, particularly desks, bedroom suites and tables, was made with fine veneers. Accompanying this came the imitation finishes of mahogany, walnut and some other woods. As the population advanced westward the furniture business gradually moved to the middle west and to the south which were nearer to sources of timber supply, enjoyed lower labor costs and also provided lower transportation costs to markets.

Accompanying these changes from the bulging population and westward expansion of the eighties and the prosperous and gay nineties, there came about a change from the multi-storied factories to one story buildings to avoid the use of elevators and therefore reduce interdepartmental transportation costs about the plant. This type of building also provided for better lighting and ventilation facilities as well as for straight line mass production. Concurrently there has come about a transition of location from the larger to the smaller communities in order to avoid traffic congestion and provide parking facilities during the automobile age of the past 20 years. These changes also provided more and better storage facilities for raw materials as well as for the finished product at lower overhead and rental costs.

Concurrently with these changes came a movement away from the classic designs and artistic beauty of manually made period furniture to the more livable, comfortable and attractive product of the mechanized precision and mass production stages of the present era.

Part II will appear in next month's issue.

This paper was first presented at a meeting of the A.S.M.E. and is reprinted with permission.

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Wood Featured in New Office

The Frank Paxton Lumber Company's new office building.

The Frank Paxton Lumber Company is now located in a new building at 6311 St. John Ave., Kansas City. Mo. The new office building and warehouse are of contemporary modern design.

Standing alongside the glass and Formica lobby entrance is a large and quite necessary totem pole. The totem pole is a new good luck omen; for on Friday, the 13th of July, 1951, the flood waters of the Kansas River swept all former buildings from their locations and over a million feet of hardwood and plywood.

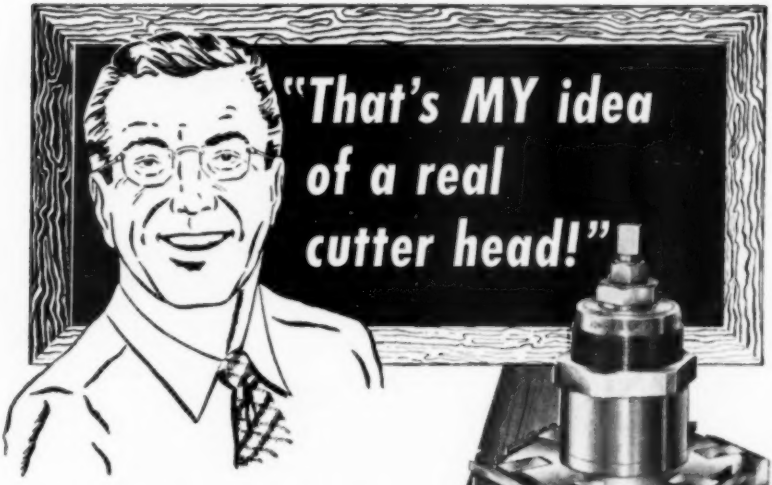
Featuring wood displays, effectively accentuated with color, the offices catch the beauty of over 100 woods and plywoods. Effective use of glass creates an air of spaciousness. The woodwork and trim are Philippine mahogany treated with a driftwood finish. The walls are edge grain fir plywood stained a neutral tan to gray.

Most unusual is the use of Formica. Aside from its customary use on desk and table tops, Formica is alternated with glass in the entranceway. The office and warehouse occupy some seven acres. With both car level and track level doors for unloading lumber from the rail siding on the west and both dock high and standard doors for outgoing materials on the east, the flow is never congested.

Though a wholesale firm, a "Craft Shop" is operated for the home hobbyist needing special pieces of wood not available from regular retail yards.

The Frank Paxton Lumber Company specializes in foreign and domestic hardwoods, carrying more than 50 species in stock. The firm also has a line of cabinet and pattern pines and hardwood and softwood plywood.

Interior of new building showing mahogany carving and free standing laminated walnut staircase.



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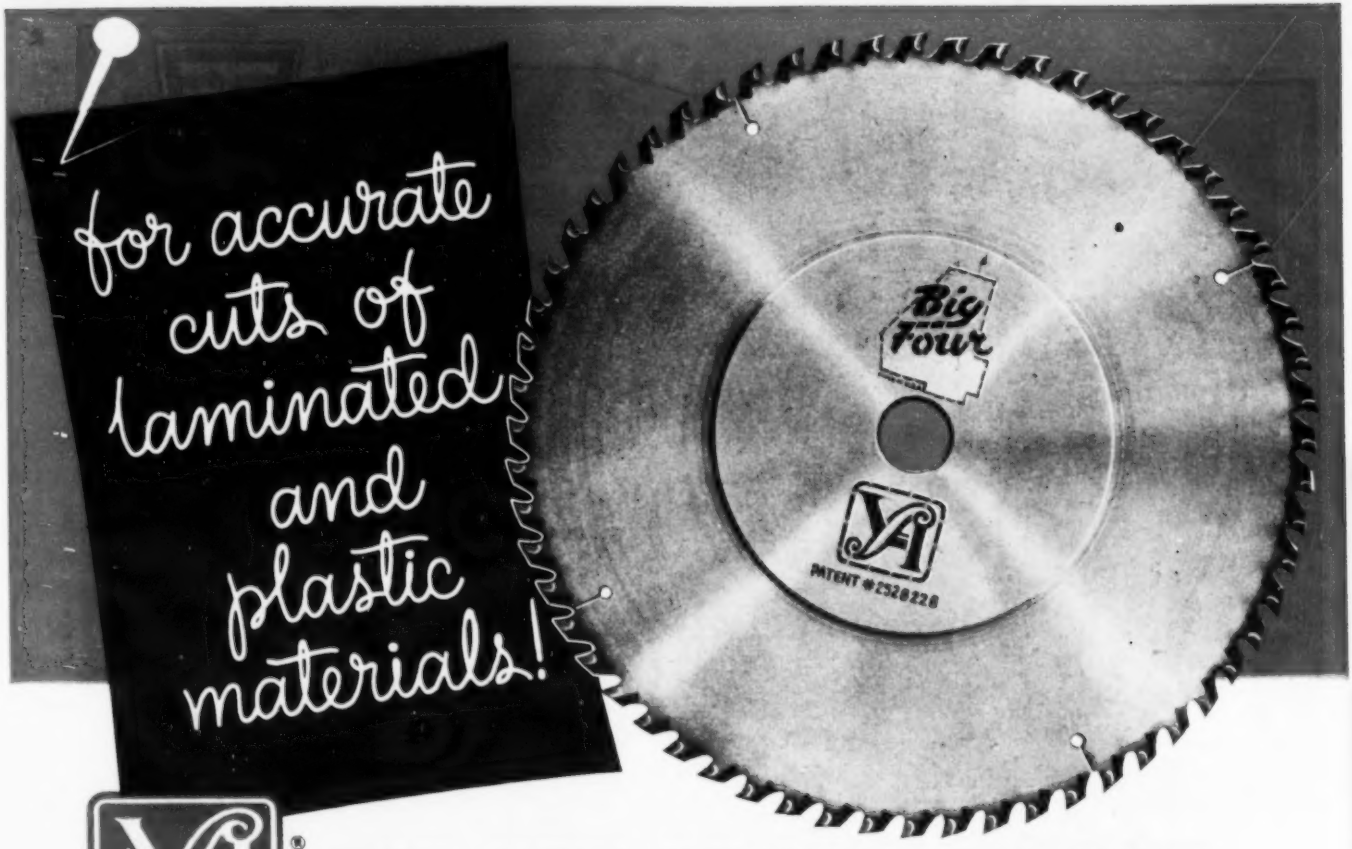

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Know your wood

GUM

BY NED BAILEY

ALTHOUGH the south claims the gums for their special gift to the users of wood, geographically gum trees have a very wide range in the New World. Beginning below the border in Guatemala, their range extends north through Mexico, the lower Mississippi valley and the Gulf states, then continues north up the Atlantic coast. However, regardless of this extensive range, it is claimed as a typical southern hardwood because they say the finest trees are found in our southland.

The gum family in general is composed of four branches—red, sap, black and tupelo and, like most family branches, each has its own personality. Speaking of the gum family as a whole, it has certainly measured up to the highest standards set for it in a wide variety of uses. These include everything from the protected interior of the home to the rugged exposures of war. The southern hardwood folks claim that there are few artistic expressions or utilitarian requirements, through the medium of wood, that cannot be filled satisfactorily by one or more of the members of this typically southern hardwood family.

Gum, beautiful in itself, has the unusual faculty of being able to simulate many of the world's rare and expensive woods. Red gum, for example, is particularly adept at this simulation. Black gum, when quarter-sawn, shows a ribbon stripe that is so similar to that of striped mahogany that once the reddish mahogany color has been applied, only an expert can tell the difference. The unusual and variable figures of quarter-sawn red and sap gum make it possible, through treatment, for a product to have an expensive appearance without its manufacture involving the higher cost.

Gum woods offer a medium that yields readily to the blades of the hand carver with his delicate touch, and, at the same time, resists the powerful impact of high speed machinery sufficiently to retain the form required of it in mass production. These woods possess a mild, uniform texture, with a degree of hardness about midway between that of the softer hardwoods and of the hardest of the hardwood species native to America.

Gums for a long time had, with justification, a reputation for instability. This has been effectively dispelled with the development of advanced technical knowledge of drying gum in modern kilns that are designed and operated on a sound basis of established facts. Formerly most of the drying was done on the "by-guess and by-golly" basis by industrial operators who never were able to agree on the right method of drying gum.

With modern scientific drying of gum, it can be used in the assembly of parts, whether it be in a piece of fine

furniture or in an article designed for rough treatment. Yes, gum has proved its ability to stay in place, to hold tightly together with any fastening agent, be it nails, screws, glues, or any special type of fastener.

Although often used to simulate other more expensive woods, gum can stand on its own merits. Gum has earned world-wide acceptance and popularity strictly on its own merits. This is indicated by the fact that it is often referred to as America's finest cabinet wood, playing a major part in this nation's furniture industry. Gum trim and panels are a decorative adjunct for beautiful interiors, giving an air of distinction wherever used, either home, office or elsewhere.

For products requiring a paint finish such as kitchen cabinets, built-in features, toys and novelties, the clear white wood of tupelo and black gum, with their smooth close texture, is ideal. Gums are popular for these and other uses because they are comparatively inexpensive and in good supply. The gums are versatile, too, as shown by the fact that the same tree will yield a richly colored beautifully figured cabinet wood, as well as stock sturdy enough to be preferred for crate and box material.

As might be expected from its name, red gum has a rich red color and a satiny appearance, which is enhanced by the extremely fine grain it possesses. Red gum is available in a wide variety of grades and specifications. It may be obtained quarter-sawn or plain, and form figured or uniform colored stock. Quarter-sawn red gum often shows an attractive ribbon stripe which is particularly appealing to the makers of fine cabinetwork. The figured stock rivals the most beautiful hardwoods in the world.

Sap gum is the lumber obtained from the sapwood of the red gum tree. Since the young trees run largely to sapwood, the bulk of the sap gum lumber is cut from young stock and the red gum from the old matured timber. The physical properties of red gum and sap gum are practically the same. There are few woods that can compare with these gums for fine working qualities. They have a soft though firm texture that responds smoothly to all cutting tools, lathe turnings or carvings, and are among the easiest woods to plane. In addition to these features the gums outrank many of the hardwoods in bending qualities. As for staying qualities, with the advent of the modern kiln, this problem disappeared.

Red and sap gum have become so popular, that the annual cut has risen to a point where for several years it has been second only to oak among the southern hardwoods. The production today exceeds one billion board feet annually, most of it coming from the south.

The other two gums, black and tupelo, are, as we have mentioned, very similar in appearance and properties. Because of this similarity, there is no attempt made by the lumber inspectors to differentiate between the two. There are instances, however, where some manufacturers, owning both species in their timber holdings, cut them separately. In this way, to accommodate the trade, the lumber of tupelo and black gum can be kept separate.

The sapwood of black gum and tupelo is as near white as any wood that grows The heartwood is gray and not so much in volume as the sapwood. They are both hard to split because of their interlocking fiber, and they both have a fine uniform texture.

In quarter-sawing black gum an interesting and beautiful figure known as ribbon stripe is often found. This stock makes attractive material for furniture, interior finish and paneling. It

is specified as ribbon-stripe black gum and is usually sold in the FAS grade only. Both black gum and tupelo lumber work well, taking an excellent finish. Proper seasoning and kiln drying assure buyers of obtaining the best available stock.

These two gums are produced principally in the south and, although there is an annual cut of about 350 million board feet, the estimated stand under correct forest management will last for years.

The manufacturers of upholstered furniture have found that regardless of how delicate are the lines of an upholstered chair, lounge, settee or other item in this type of furniture, or how fragile it may appear, its strength and durability are assured when the frame is constructed of gum. When a gum is used by a manufacturer of upholstered furniture he can confidently assure the purchaser of many years of pleasure and comfort.

Because of its many virtues, gums make ideal cabinet wood, for with them no other wood is necessary in fabricating complete furniture items or lines. The lower grades are used for making the cores, crossbanding, inner frames, and other hidden parts. Then with beautiful gum for the surface veneers and quartered or plain sawn for the solid exposed parts, the piece is completed.

"NO, MAM, GUMWOOD DOESN'T COME IN PEPPERMINT."

In fact, there is no wood part of a piece of furniture that cannot be made satisfactorily of gum. Yes, the cabinetmaker certainly has a widely diversified selection to choose from for his creations. They include the beautiful and intriguing varitoned patterns of figured red gum, to the smooth and satin-like ribbon stripes of quartered red gum and tupelo, as well as the lighter marked sap gum.

The increasing predominance of the small home has emphasized the need for good substantial furniture, comparable in beauty and durability to the most expensive lines, yet obtainable at a price commensurate with the means of the small home owner. The average buyer today is looking for many pieces for his home that are smaller, lighter in weight, more compact and which have more utility value through interchange of uses. Red gum in particular is one of the woods that makes it possible for the furniture manufacturer to meet this demand.

Red gum, although it is made into many expensive pieces, is really most popular with the middle class market—the volume buyers. The manufacturer using red gum, solid or as a veneer, can provide all the beauty and durability of the most expensive foreign and domestic woods at a price the small home owner can and will pay.

At one time the idea was prevalent that costly woods possessed a monopoly on charm and distinctiveness. With the development of proper seasoning and kiln drying of the gum woods, it has been demonstrated that the idea was

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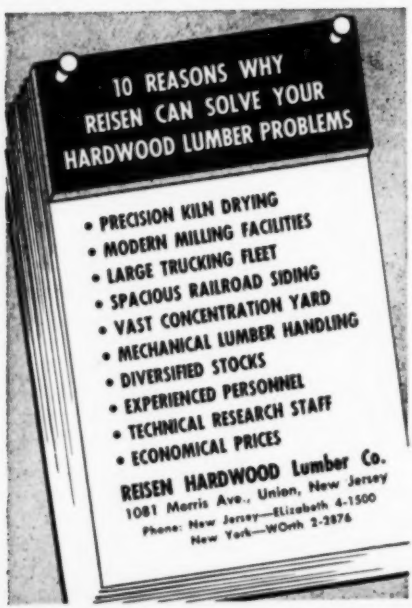

not entirely correct. Now interiors and furnishings need not be expensive to be beautiful. Reasonably priced gum woodwork, furniture and paneling are given preference by many. Like many other things in life that are inexpensive and plentiful, the gums have been overlooked, although I do feel that the matter of proper drying has influenced the situation to a large extent.

For paneled walls, no wood provides more uniform and beautifully matched material than does figured gum. The variety of decorative effects from which to choose, is so broad that the matter of monotony does not mar any interior developed around a central gum theme. The interior designer certainly has a wide choice, from the deep richness of red gum's reddish brown, to the lighter hues of sap gum's pinkish tints, and from the brownish gray heartwood of black gum to the near white natural blondeness of tupelo. For less ornate paneling, quartered black gum with its iridescent ribbon stripes, is a good selection for home or office.

The gums are not good in contact with the soil, nor generally for exterior uses. However, for sturdy packaging, gum has the strength and durability that are required. One of the greatest sources of supply for the shipping container industry is that of the lower grades of gum, particularly those of sap, black and tupelo. Evidence of gum's role in moving the world's merchandise comes from the conservative estimate that more than a quarter billion feet are used annually in constructing various types of boxes, crates, barrels and baskets. Gums offer the attributes that are mandatory in sound packaging. They have a texture which is easy to fabricate, yet highly resistant to the destructive elements of rough handling. It is believed that gum's interlocking grain, which retards splitting and enhances nail-holding ability, assures a package with utmost protection of its

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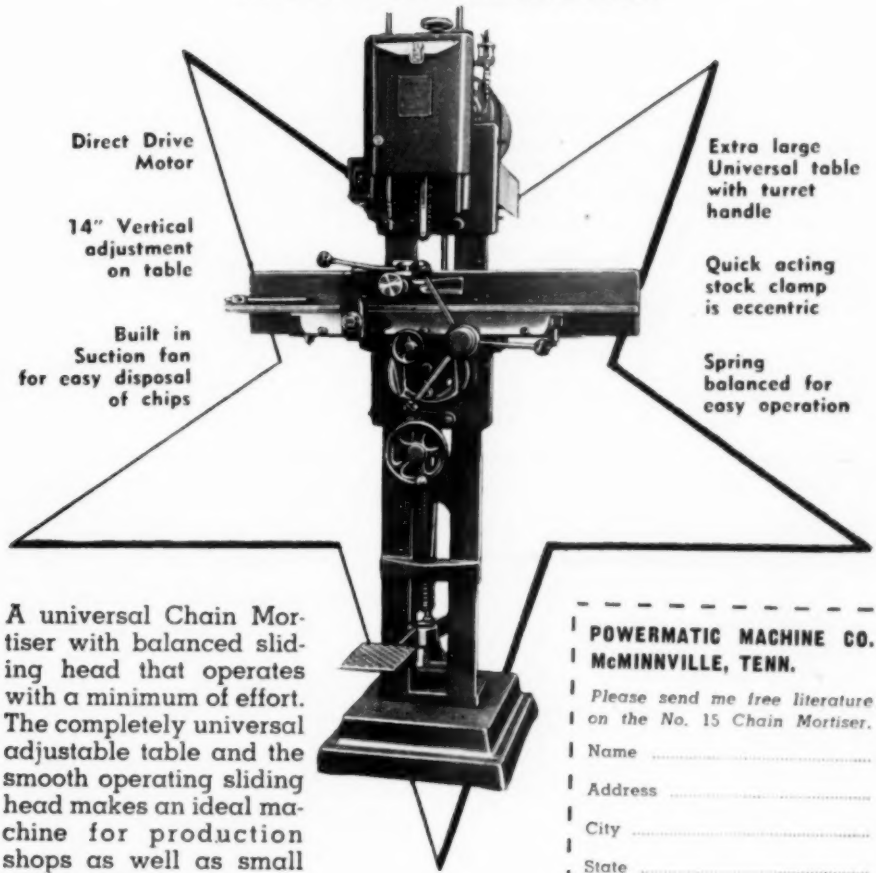

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contents. Interesting too, is the fact that the near-whiteness of the sapwood of black gum and tupelo makes both species ideal for containers on which names, trademarks and advertising can be printed.

AMERICAN WOODS

The various short articles we have been carrying on American Woods have been made up in booklet form. The booklet describes 88 trees. Send 25c to the Editor, WOOD WORKING DIGEST, 222 E. Willow Ave., Wheaton, Ill. for your copy.

A bar is something which, if you go into, you're apt to come out singing a few of and might get tossed behind.

COURSE IN WOODWORKING PROBLEMS

Practical problems of the woodworking industry will be covered in an intensive one week course at the University of Michigan Wood Technology Laboratory, August 10-15, at Ann Arbor, Mich.

This course is designed for executives, plant personnel and quality control men. Because much of the program is concerned with learning procedures and techniques, the enrollment will be limited to 18 persons.

Specific problems in drying, machining, gluing, finishing and fabrication of wood will be discussed. The course will deal with causes of rejects and how defects and poor production and design practices can be eliminated or kept to a minimum.

Applications for enrollment can be made by writing Institutes Department, University of Michigan, Extension Service, Ann Arbor, Mich.

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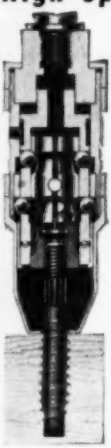

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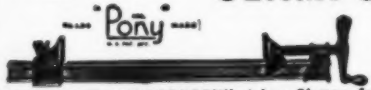

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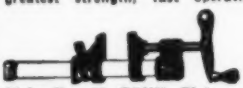

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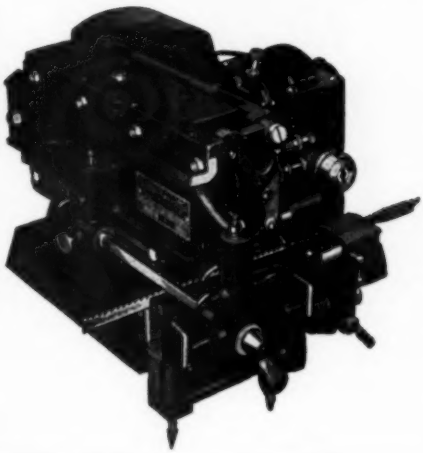

This improved saw sharpening machine has features that are found nowhere else. When the band saw is clamped into position, every operation is completed without removing saw from clamp. It files, sets and joints, doing the work of 4 men sharpening by hand.

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WOOD CARVING TOOLS

A new line of Stickleback professional wood carving tools is being offered by the W. W. Drilsaw Co., 1561 Virginia Ave., Glendale 2, Calif. The tools are made in the western zone of Occupied Germany.

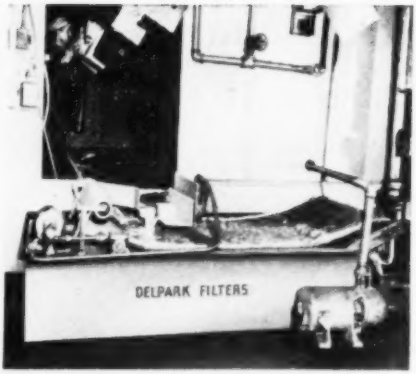
About 150 different tools—in a great variety of shapes and sizes—are available. The tools have hardwood handles and are constructed of fine quality imported steel. Average over-all length of the tools varies from 5" to 8".

A line of lighter professional tools is also available in 20 shapes. These include knives, gouges and chisels.

FILTERS FOR SPRAY BOOTHS

The Delpark Corporation and the Industrial Filtration Company of Lebanon, Indiana, have developed a filtration system for the removal of paint sludge and particles from paint spray booth water. Delpark filter system for paint spray booth water has helped to overcome many of the major problems formerly involved in the operation of paint spray booths.

Of primary importance has been the necessity of removing as completely as possible the overspray from painting operations. External dirt, ever present



in the atmosphere of the normal manufacturing plant has, in some instances, added to the problems involved. Most modern methods require considerable labor in maintenance and hand skimming operations.

In using this system, a pump causes the water to flow over weir. As the flow increases, paint matte builds up in front of weir. Under water jets move it to weir. Eventually paint matte builds up in front of weir momentarily shutting off flow of water. As water level builds up this paint matte will float over weir.

TEST REVEALS PRESENCE OF PENTA

Chapman Chemical Company, Memphis 3, Tennessee, has perfected a new color test for determining the presence of penta-chlorophenol in wood.

According to Dr. E. A. Behr, director of research activities at the Chapman laboratories, the test is very sensitive, and will detect minute amounts of penta even in cases where all the solvent has left the wood. Neither moisture nor substances in the heartwood of the wood being tested interfere with the test. One of the chief advantages of the Chapman test is the fact that only simple and inexpensive equipment is required. Any species of wood, unseasoned or dry, may be used, and the increment borings used in the test may be saved for future reference.

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MEMPHIS 3, TENNESSEE

May 13, 1952

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We are happy to say that we chose several of your machines for key spots in our plant. We are presently using a Porter Hydra-Cut Saw, two Porter Routers and a Porter Shaper. To date we have had excellent results with these machines and are highly pleased with their performance. We have not regreted our choice and wish to commend you highly on the quality of your product.

Yours very truly,

S. R. HUNGERFORD COMPANY, INC.

J. A. Jaques
Vice President, Assistant Superintendent of Production

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The General FINISHING PICTURE

By Thomas P. Kelley,
Lilly Varnish Company
of Gardner, Mass.

A LOOK at the recent and present trends in furniture designs and finishes is very interesting from an historic, social and economic viewpoint. Early American furniture was often home-made, simple and pleasing and, above all, functional. The available finishes were also simple, generally linseed oil used alone or with the addition of earth colors or vegetable dyes. Except for some solid colors, most finishes were clear and transparent, which accentuated the natural beauty of the wood. As wealth in the colonies increased, furniture was imported from Europe, principally from England and France. This was more classic in color and line. These early imports and their reproductions in this country were masterpieces of craftsmanship. As our furniture industry developed, we went from simple designs and finish to the heavy ornate types which culminated in the unsightly designs of the late Nineteenth Century.

After World War I, living became less formal, and the trend has been away from the large home and ornate furniture to the early simplicity. Since World War II and its economic consequences, this trend has been accentuated. To be sure, the modern simplicity is different, more sophisticated in both color and design and especially functional.

Modern design has given added importance to the color treatment of the furniture. In the present small home, it must be decorative and suggest warmth and spaciousness. This intimate connection of color and design means that the finishing industry must work more closely than ever with the furniture designer to develop the eye appeal that means more sales. In the old days, the furniture foreman finisher was usually called upon to develop a new color, but the increased demands on his time, in this day of mass production, make it practically impossible for him to do this no matter what his qualifications. As a consequence, we must train or hire color stylists in our own industry. These

are specialists with experience in furniture finishes who have that peculiar knack of developing color effects which meet the requirements. They are an important factor in our business today.

Light clear colors have been growing in favor and probably will continue to do so. They run from the various shades of blonde to colors of intermediate depth. They are used principally on modern furniture and blend in with the lightness, compactness and utility of design. These light colors present an economic problem to New England furniture manufacturers who use birch and maple, because to obtain these effects, they must use sapwood which is very expensive. For very light blonde colors, the wood is also bleached. This is adding cost of bleaching to cost of sapwood. As a result, bleaching is not done as extensively as it was some years ago and is on a downward trend. Most of the light colored effects can be produced by use of a suitable transparent toner used with the proper pigment wiping stain.

This still presents the problem of using heartwood. In the case of birch heartwood, some clear darker colors, such as light tobacco, have been developed which lend themselves to the modern designs. Heartwood can also be used for the antique colors, especially where shading is employed. Some new modern colors, that are definitely on the dark side and resemble walnut finish in depth, but have a clear transparent purple tone, are helping in this respect also. In addition, heartwood can be used for solid colors such as black, either plain or decorated. This field is limited, however, but with some manufacturers, it is an appreciable percentage of their production. Solid black furniture is used as a complete room setup or in individual pieces as an interesting contrast with lighter colors. Birch heartwood can be used in some of the lower grades of colonial furniture.

Maple heartwood presents quite a challenge. In rock maple, it varies from almost black to black. A solid color finish is one answer. It is possible that the trend may be toward solid color. This has happened before and if it does again, the problem of using inferior grades of wood will be near solution.

Fine furniture has had quite a vogue for some time now. Percentagewise, it is not very great in the total furniture output, but production seems to be holding its place at its present volume.

Mahogany and walnut are also being finished in colors ranging from blonde and sea foam to traditional darker colors. With few exceptions, the total finish is clear and the character of the grain is enhanced. For some of the light colors on mahogany, solid covering toners are used, especially for the gray colored finishes. Contrasting colored fillers are used to give interest to the finish. For the blonde or very light colors, the wood is bleached which is an expensive operation. To eliminate bleaching, and still have grain characteristics approaching mahogany, naturally light colored woods are being used. One of these is Korina. This is used today for very light blonde colors without bleaching as well as darker more traditional colors.

In conjunction with color development, the character of the total finish is coming under closer scrutiny. More and more demand is made for tougher and more durable finishes. The Industrial Division of the Paint, Varnish and Lacquer Association does not have any specifications for finish characteristics. To draw up such a code would be a very difficult task because so many coating operations are required to produce a desired color and some of these operations do not have a beneficial effect on the total film. For these rea-

sons, each finishing manufacturing concern must endeavor to produce a total finish to meet all the desirable qualities that are demanded.

We have our laboratory tests which are applied to all new finishes. These include ball drop tests for flexibility, adhesion tests, tests for hot dishes, printing, uviarc test for color permanency, tests for alcohol resistance, fruit juices, cold check, and abrasion.

Lacquer is still the most widely used finish due to its speed of drying and ease of handling, patching and surfacing. It probably will maintain its number one position for some time to come. As a step toward economy in finishing, hot lacquer is finding increased use. It is generally of higher solid content than the conventional cold lacquers and contains about 30% to 33% solids for clear and furniture lacquers. Hot lacquers have the advantage, when properly formulated, of giving more build on the work per coat, with smooth flow-out and absence of blush in very humid weather. They are heated to 140°F. to 160°F. Due to loss of heat in the spray hose, but especially in the atomization of spraying, the temperature of the lacquer when it reaches the work is about 80°F. to 90°F. Cold spray lacquers are 10 to 15 degrees lower in temperature when they reach the work. The heating of the lacquer permits the use of higher viscosity and solid content.

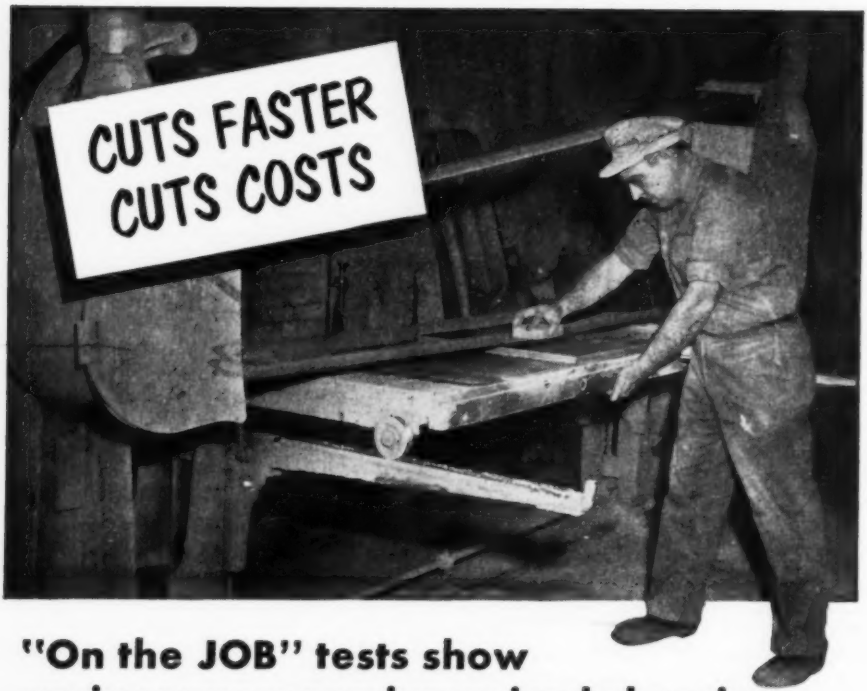
In some finishing operations, a saving of a coat of cold lacquer may be made for a required film thickness on the work by the use of hot lacquer. In other cases, the film thickness required may be such that the same number of hot lacquer coats are needed as of a cold lacquer even though the total thickness of the hot lacquer film is greater. In other words, one less coat of hot lacquer would produce less build than needed. In such cases, and there are many, cold lacquer has been found more economical. Hot lacquer has its use, but it is not a complete replacement for cold lacquer. Developments have been made that have improved the total toughness and durability of lacquer finishes. They can be made resistant to certain percentages of alcohol mixes and to moderately hot dishes, but are still not impervious to nail polish.

Shortly before World War II, a heat curing clear varnish for furniture was developed. It did not receive very wide acceptance at the time due to the fact that it required baking facilities in the furniture factory. Another factor was the war itself and the resultant shortage of raw materials.

However, interest has increased since the war and this interest and use is growing. When used over the proper clear first coat, it produces a tough, durable finish that is proof against practically any household liquid and withstands the effect of hot dishes exceptionally well.

To sum up, the industrial finishing industry has been conscious of its role in working more closely than ever with the wood furniture manufacturers and their designers to help them produce the interesting colors of today; to develop colors to use effectively on the less desirable grades of wood and the so-called substitute woods. The upgrading of furniture that has taken place has called for a corresponding upgrading in finish. The cooperation of the furniture manufacturer and the finishing industry to achieve these ends has developed closer ties between the industries and this will be increasingly evident in the future.

This paper was first presented at a Northeastern Section meeting of the Forest Products Research Society and is reprinted with permission.



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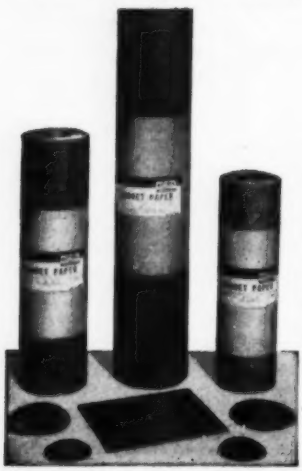

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How To Cut Spiral Wound Abrasive Drum Covers

By Wm. T. Conway

SEVERAL types of drum sanders that require spirally wound coated abrasive drum covers are being used in the woodworking industry. When such drum covers are worn and ready for replacement, the new covers are commonly cut from rolled stock and installed by factory maintenance personnel or by the machine operator. Improper cutting of the cover often leads to waste or malfunctioning of the machine. By following the procedures outlined below, a minimum of coated abrasive stock will be lost and the new covers will fit their drums accurately.

Two separate procedures are offered because two basic types of spirally wound drum machines are in use. On one type of machine the coated abrasive cover is butt wrapped on a smooth drum. On the second type of machine, the abrasive cover is overlapped along the spiral. The drum on this type of machine has a spiral groove on its surface to allow for the double thickness of coated abrasive. On both types of machines the abrasive cover is clamped at either end of the drum with a suitable take-up device to keep the cover snug on the drum surface.

Practically all of these drum sanders are designed to use 24" wide rolls of coated abrasive, either paper-, fiber- or clothbacked, or with combinations of these materials. Because the diameter and length of the drums vary according to manufacturer, the abrasive covers must be cut to fit the individual machine. Therefore, measurements must be made on the spot or from specifications written for the particular model involved. Basic drum dimensions are length and diameter, as in Figure 1, and must be measured in inches. Basic dimensions for the coated abrasive cover are the length of the taper (T) and the length of the cover (P), in Figure 2; both dimensions will be determined in inches.

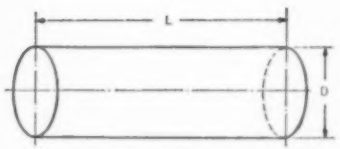

Fig. 1

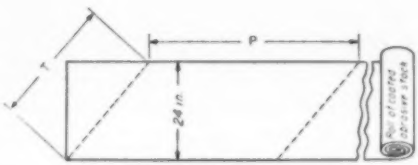

Fig. 2

Butt Wrapped Spiral Covers (All Dimensions in Inches)

(a) Calculate area of drum (AD) to be covered.

AD=length of drum (L) x diameter of drum (D) x 3.14

(b) Calculate length of abrasive cover (P)

$$P = \frac{\text{area of drum (AD)}}{\text{width of coated abrasive (24")}}$$

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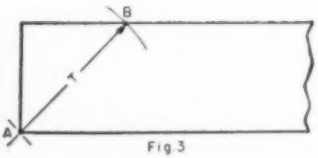

Fig. 3

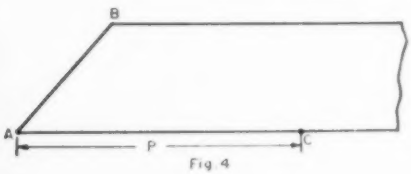

Fig. 4

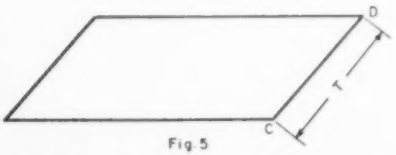

Fig. 5

(c) Calculate length of angle cut or taper (T)

T=diameter of drum (D) x 3.14

(d) Knowing the length of angle cut

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110-120 VOLTS or 220-240 VOLTS AC or DC.
One quart. Two quarts. Four quarts.
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Fig. 6. Rolls of coated abrasive stock for a drum sander are usually kept on vertical rack near the machine. No stock should be wasted after a roll is started with first taper cut as shown because successive cuts will leave the roll with proper leading angle.

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(T), scribe an arc with a string or rule of radius T from one corner (A) of the coated abrasive until it intersects the opposite edge (B) of the coated abrasive as shown in Figure 3. Cut the cover on a straight line (AB) between the two points. Always cut covers from the back side of the coated abrasive. There is less wear on the knife's cutting edge.

(e) Referring to Figure 4, measure off the calculated length of the cover (P) along the edge of the coated abrasive (AC).

(f) Repeat (d) scribing arc of radius T from point C on Figure 5 to locate point D. Cut straight line CD.

After initial cover has been cut from a roll of coated abrasive, each cover after that is cut by merely repeating steps (e) and (f).

Overlapped Spiral Covers

(a) Calculate theoretical circumfer-

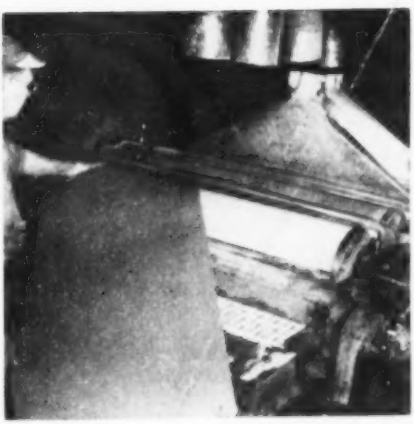

Fig. 7. Starting a new coated abrasive cover onto front roll of triple drum sander. Leading point of the cover is clamped to the drum by edge clamps, and by rotating drum slowly the cover is pulled on. The worn cover has been removed, exposing felt padding.

ence of drum (CT) and length of angle cut or taper (T).

CT=diameter of drum (D) x 3.14

width of overlap (measured parallel to edge of drum)

also, T=CT.

(b) Calculate area of drum (AD) to be covered.

AD=length of drum (L) x theoretical circumference (CT)

(c) Calculate length of abrasive cover (P)

$$P = \frac{\text{area of drum (AD)}}{\text{width of coated abrasive (24")}}$$

(d) Knowing T and P, follow steps (d), (e) and (f) given previously for butt wrapped covers.

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The Aget-Detroit Company, 605a Main Street, Ann Arbor, Mich., announces improvements and changes in the Econaway abrasive belt splicer. These changes have cut down the time required to splice abrasive belts. It is also claimed that the improvements increase the quality of splice, save shop bench space and save in the cost of abrasive belts.

The improvements include: an enclosure for the motor, the belt drive and the arbor which carries the grinding wheel; cutter and press bars are now mounted on top of the enclosure; an electrical curing press to reduce the curing time from 24 hours to less than 60 seconds.

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This abrasive belt splicer will splice abrasive belts in any width up to 14".

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Safety SECTION

WATCH OUT - - - FIRE!

INSURANCE—no matter how complete—cannot possibly cover everything that would be lost in a woodworking plant fire! "That's why everyday safety measures to guard against every fire hazard are a real must," says Homer Lee Davis, president of Davis Manufacturing Co., 1075 S. Clark St., New Orleans, La. Davis is not a safety engineer theorizing on the subject. He is a practical shop owner.

Fires cost American business a whopping $784,953,000 in 1952. Authority for that figure is the National Board of Fire Underwriters. That figure would probably be even larger if it were possible to show the amount of business lost because the shop was not working. Davis believes that it is simpler and a lot cheaper to remove the hazards than to risk property and interrupt production because of a sudden blaze.

What can be done by way of daily precautions to guard against the danger of fire in a woodworking plant? Here are a few of the steps that can be taken.

1. The Davis Manufacturing Company has set up two smoking periods a day. Workers are not permitted to smoke at other times.

2. Sprinklers to be effective must be checked regularly.

"Put it out—now," warns shop superintendent, R. L. Watts, to worker dangling cigarette out of his mouth.

Varnish and other inflammable materials are always kept in covered vats.

3. Extinguishers should be located in strategic places. They should be easily accessible. At the time of a fire there is no time lost removing lumber or anything else that may have been piled near the extinguisher. Solution in the extinguishers must be checked regularly.

4. Waste paper as well as other combustible waste materials goes into fireproof containers. The shop is regularly "policed" to be sure the best housekeeping methods are being used.

Efficiency of the sprinkler system can mean the difference between a quickly contained flash fire and disaster. The sprinklers are checked regularly.

5. It is important in the Davis Manufacturing Company's fireproofing plan that varnish and other inflammable materials be kept in covered vats.

6. To prepare for the hoped-against, this plant posts "what to do" rules prominently and insists that all employees become familiar with them.

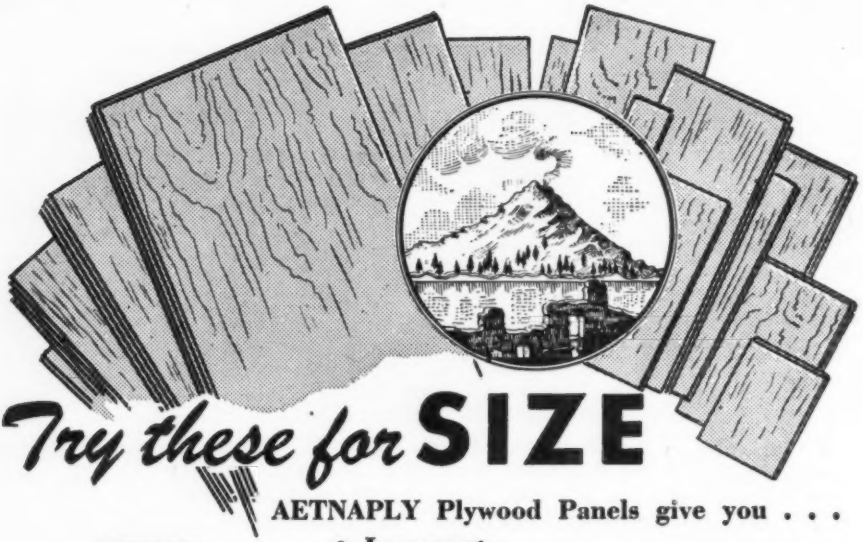
7. Hoses can rot. Therefore, the Davis Company makes a practice of inspecting them regularly to make sure that they are in top operating condition.

8. Fires can start in offices as well as shop areas. Good housekeeping precautions are taken here as well.

The accompanying pictures illustrate a few of the measures which are taken by the Davis Manufacturing Company to prevent the danger of flash flames.

AMERICAN WOODS

The various short articles we have been carrying on American Woods have been made up in booklet form. The booklet describes 88 trees. Send 25c to the Editor, WOOD WORKING DIGEST, 222 E. Willow Ave., Wheaton, Ill. for your copy.



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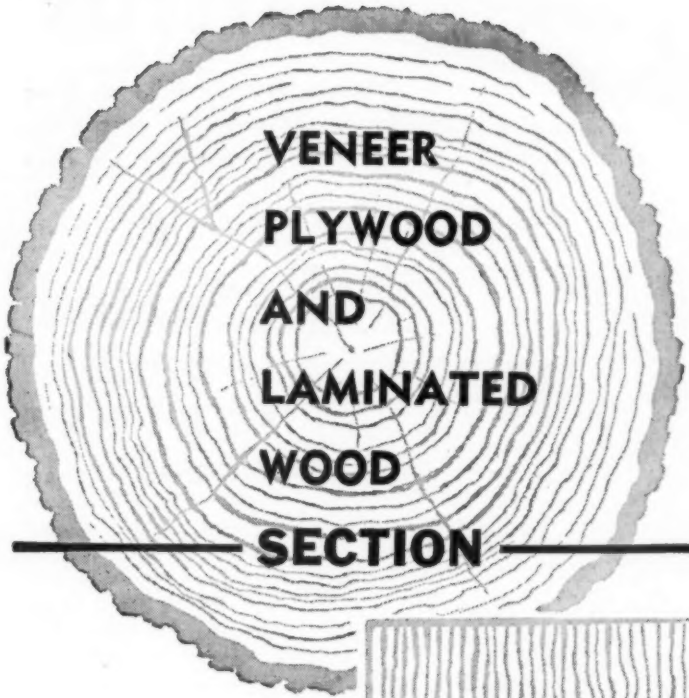

VENEER PLYWOOD AND LAMINATED WOOD SECTION

Features . . . .

Veneer and Plywood
Machinery
Part 5
By Thomas D. Perry

Veneer and Plywood
A Door and Its Core
By Ned Bailey

Smooth... PRODUCTION-PROVED PLYWOOD PRESSES

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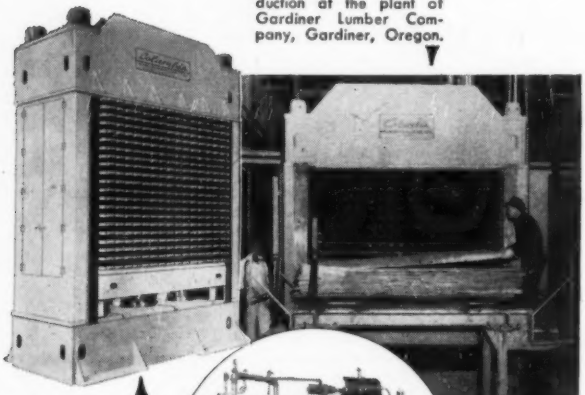
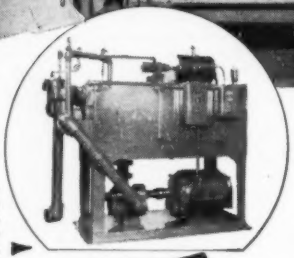
One of two 4' x 8', sixteen opening Columbia Hydraulic Hot Plate Presses operated for plywood production at the plant of Gardiner Lumber Company, Gardiner, Oregon.



20 daylight Standard Columbia Hydraulic Hot Plate Press, open.



Columbia Hydraulic System showing arrangement for gravity feed to high volume pump.

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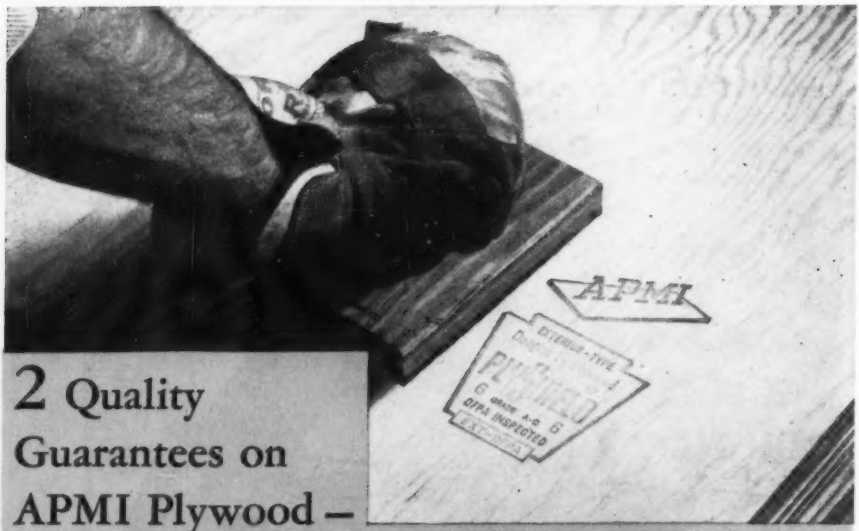

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VENEER and PLYWOOD MACHINERY

Part 5

Veneer Driers

By Thomas D. Perry

THE problems of drying veneer involve not only moisture removal, but also flatness and freedom from checks and splits. This means that the rate of drying, from end to end and from edge to edge, must be as uniform as possible. In thicker veneers there must be no premature surface hardening, which tends to seal the moisture between the surfaces.

Basic Drier Design

Veneer driers consist of large enclosed chambers, well insulated, with recirculating fans and heaters which maintain the internal air at the point of proper moisture deficit to evaporate the moisture and draw it out of the veneer at a predetermined rate. In most instances the air movement is parallel to the surface of the veneer, although there are also designs that blow the air vertically against the veneer surfaces, as the veneer travels across and between long narrow slotted air inlets. This is called the impinged air type.

Automatic temperature controls are of distinct assistance in maintaining uniform temperatures, either at each heating coil, or at the outfeed end of the drier. Authorities differ as to the desirability of a progressively higher or lower temperature from one end of the drier to the other, and both methods are reported to give good results.

The veneer moves progressively and horizontally, on conveyors or rollers, from the infeed to the outfeed end of the drier, at a speed that will reduce the moisture content of the veneer to the desired percentage of moisture during one complete drying cycle. Thin veneer permits a faster movement through the drier than thick veneer, since 1/16" veneer, obviously, will contain approximately half as many pounds of evaporative as does ⅛" veneer, of the same percentage of moisture content. Raising the temperature is another method of shortening the drying cycles, although speed regulation is the more usual method.

There are two major types of veneer driers: (1) to dry green veneer down to shipping dry, about 10% to 12% m.c., or to dry green veneer down to gluing dry, about 3%, which is customary in Douglas fir plywood mills, where rotary cutting, clipping, drying and gluing are relatively continuous; and (2) what are properly called redriers, to reduce from shipping dry, in hardwood plywood mills, to about 5% to 7% m.c. for gluing. Redriers are also used for final flattening, which is an important step in face veneers which are to be matched, or in thick veneers which are to be spliced in tapeless splicers.

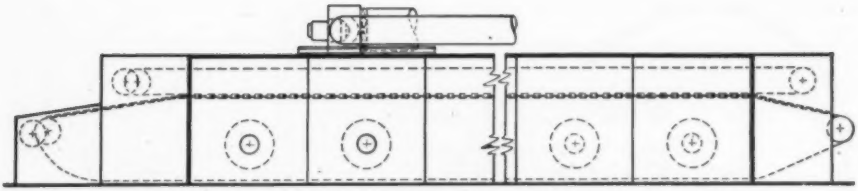

Fig. 1. Longitudinal cross section of Proctor single deck veneer drier.

Types of Veneer Conveyors

There are two principal types of conveyors used to forward the sheets of veneer through the drying chambers: (1) endless belts, consisting of wire links, spiral coils or woven mesh; and (2) pairs of rollers, the lower of which is driven, and the upper providing the pressure needed to carry the veneer forward, and at the same time keeping the veneer reasonably flat. A third type still finds considerable use, although new installations of this type are now rather infrequent. It consists of a pair of rollers, followed by a pair of hot plates, another pair of rollers, another pair of hot plates, in an alternate series through the drier. When the plates are open, the rollers advance the veneer a distance equal to the width of the hot plates, usually about one foot. As the plates close, the forward motion stops, and there is a brief moment of contact between the hot plates and the veneer. As the plates open, the rollers again advance the veneer, and so on. It is an intermittent forward movement that has been flippantly described as resembling the jumps of a grasshopper.

Single Deck Wire Conveyor Driers

A typical cross section of several units of a single deck veneer drier is illustrated in Fig. 1. Crosswise circulation is provided by fans and heaters in each section, permitting differential temperatures from the infeed to the outfeed end, if desired. Normally there is at least one reversal of circulation in the length of the drier. The fan noted at the top of the drier provides for the removal of part of the moisture laden air, which has done its work. Only part of the air is withdrawn and the balance continues in circulation, so that the humidity of the air in the drier will prevent too rapid surface drying.

Fig. 2. Single deck Proctor[1] drier with wire and girt conveyor.

A standard width of such a drier is 18 feet, with a length of 48 feet, although additional lengthwise units can be added. Typical schedules for such a drier, operating on 1/28" mahogany veneer, would be a time cycle of 3 to 5

[1]The "Textile" veneer drier, made by the Philadelphia Textile Machinery Company, has long been well known in the veneer industry. About 1920 the name of the company was changed to Proctor & Schwartz, Inc., and the veneer driers were renamed "Proctor" driers. However, the earlier name still persists and even yet finds wide use in veneer and plywood circles.

Fig. 3. Single deck Proctor drier with coiled spring conveyor.

minutes at temperatures of 280° F. to 240° F. This would dry to approximately 10% m.c., which is considered normal shipping dry. On ⅛" mahogany, the time cycle would be increased to 10 to 12 minutes, under the same conditions, the time of passage through the drier being reduced by slowing down the conveyors.

The photograph in Fig. 2 shows such a drier, with wire and girt conveyor links, about one inch apart. The top conveyor chain starts just behind the top cross frame and holds the veneer flat during the entire drying cycle. In this photograph the strips of veneer are entering the drier crosswise, a method especially adapted to sliced face veneers, where it is important to keep the successive sheets in sequence for preparing matched faces. This type is equally adaptable to endwise feeding, or to handling dimensioned pieces of rotary cut veneer. The wire links are of a special stainless alloy that will not discolor the green veneer during drying.

A similar single deck veneer drier is shown in Fig. 3, in which the conveyor belts are continuous coiled springs, running in grooved shafts, and spaced 2 to 3 inches apart. This results in automatic tension, and is popular with many veneer operators. Both types of conveyors give good service, but some mills have distinct preferences. Two flitches of sliced veneer stand in front of the drier in Fig. 3, requiring practically the full width of the machine for crosswise feeding.

Multiple Deck Wire Conveyor Driers

A multiple deck veneer drier of the cross circulation type, equipped with wire and girt conveyors, is shown in

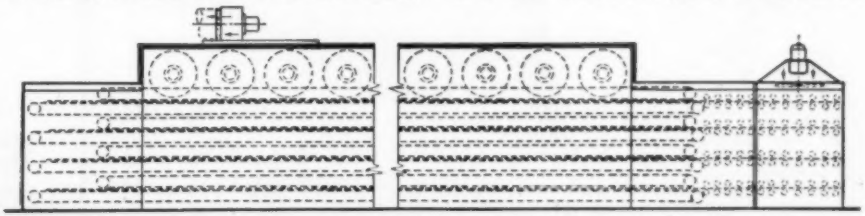

Fig. 4. Longitudinal section of four deck Proctor drier with cooling fan.

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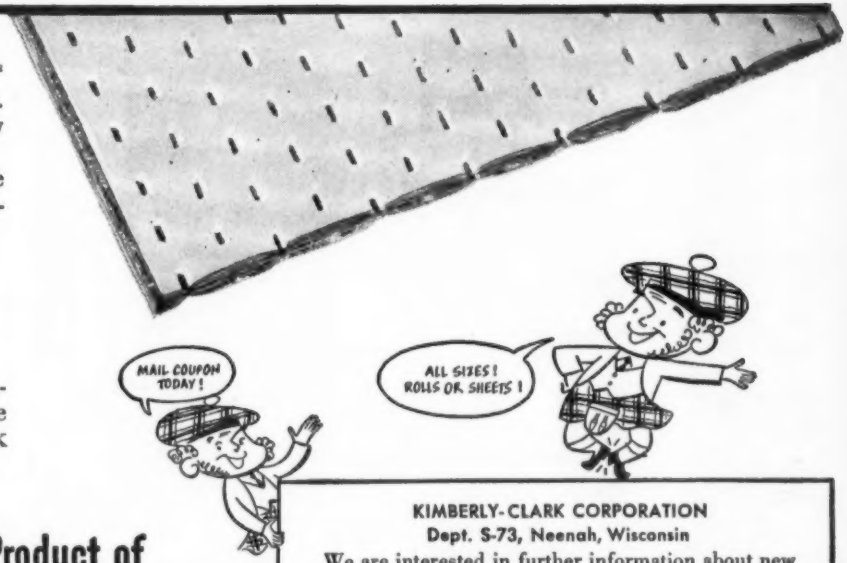

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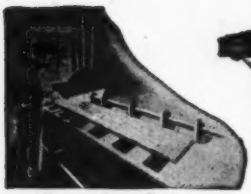

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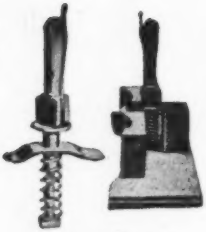

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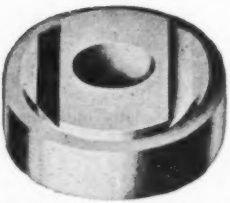
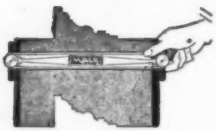


Ball Bearing Shaper Guide Collars

Micrometer Setting Gauge

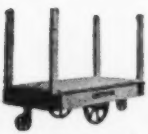


Reproducing Template

Universal Vise

Lumber Gauge

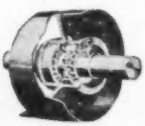
Planer Bolts



Factory Truck

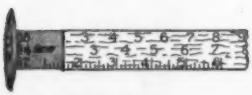
Moisture Meter

Quick Acting Vise



Ball Bearing Loose Pulleys

Picket Pointer



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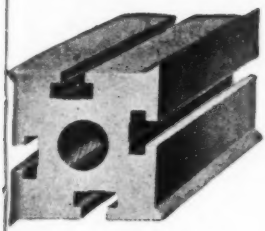
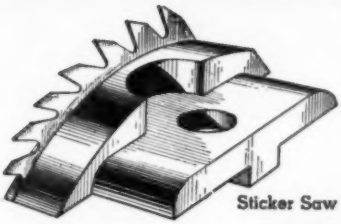
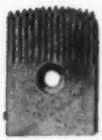

Sticker Head


Sticker Saw Heads


Tenoning Spurs

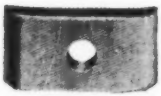
Sticker Springs

Shaper Knife

Matcher Bits

Balance Scale

Sticker Posts


Sticker Caps

Molders Gauge

Milled Knives

Coping Knives

Moulding Knives

Planer Knives

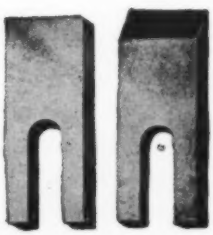
Thin Knives

Shaper Steel

Steel Rolls

Tenoning Knives

Rabbet Blanks


Blanks

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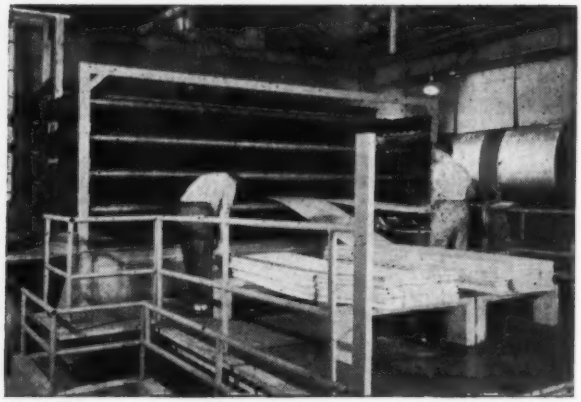

Fig. 5. Infeed end of four deck Proctor veneer drier.

Fig. 4. This type is designed particularly for large production demands in the fir areas of the West Coast. A standard drier of this type, 56 feet long, with temperatures between 330°F. and 350°F., drying ⅛" fir down to 3% m.c., will have the following operating cycles:

Heartwood, with low moisture content ..... 9-10 minutes

Sapwood, with high moisture content ..... 16-17 minutes

At the outfeed end of this drier (at the right) can be seen a series of rollers, moving the dried veneer under a cooling fan (on top), which reduces the temperature of the veneer for immediate inspection and gluing. Unless veneer is reasonably near room temperature, when the glue is spread, there is serious danger of pre-cure in the hot press. The extreme dryness of 3% m.c. is particularly important in gluing up Douglas fir plywood. In hardwood mills, for immediate gluing in hot presses, the moisture content should be of the order of 5%.

The infeed end of a similar four deck veneer drier is illustrated in Fig. 5, differing from Fig. 4, in having an infeed roller table, the several decks being charged from an elevator platform shown in the foreground of the photograph. While the veneer can be fed either sidewise or endwise, the latter is usually preferred, since most of the veneer handled in these multiple deck veneer driers is of relatively unfigured wood. Drying flitches of face

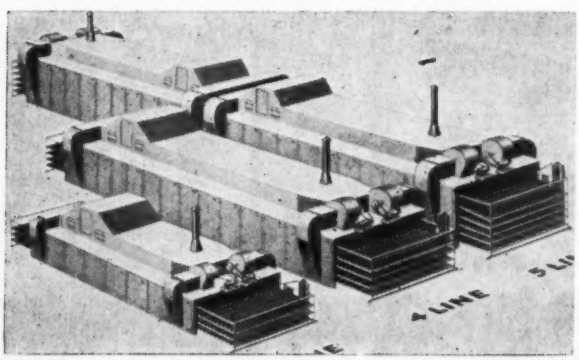

Fig. 6. Types of Coe veneer driers with roller conveyors.

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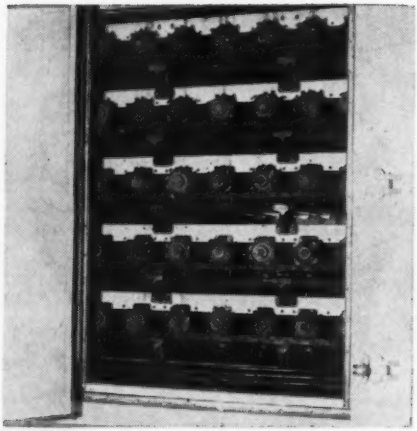

Fig. 7. Drive chain side of Coe veneer drier.

veneer in a multiple deck drier complicates the problem of keeping the sheets in sequence.

Roller Conveyor Driers

Roller driers employ pairs of rollers for moving the veneer forward, instead of the wire conveyor belts described above. Such driers are adapted to crosswise or endwise feeding on rotary cut veneer, but narrow sliced veneer must be fed endwise, on account of the spacing between the roller units. They are extensively used, both in softwood and hardwood plywood mills, but they find their widest use in fir plywood manufacture on the Pacific Coast, where production requirements are enormous.

Several types of multiple deck roller driers are illustrated in Fig. 6, with the infeed end toward the reader. These types of roller driers have longitudinal air circulation, with cooler and wetter air at the infeed end, which becomes progressively hotter and drier toward the outfeed end. Roller driers are usually 12 or 15 feet wide, and are built in sections about 5 feet long, the total length depending on the number of sections assembled in a single drier. Machines as long as 153 feet have been so assembled, with a height of six decks. Banks of heating coils of fin type radiation are installed, throughout the length of the machine, above and below the conveyor rollers. Moisture laden air escapes through the vent stacks, shown above the drying chambers in Fig. 6.

The lower roller in each pair is driven by a continuous sprocket chain, which rests on the sprocket gears. At the opposite end of each pair of rollers is a pair of star gears, which drive the upper rollers. These upper rollers rest on the lower rollers and provide the required pressure on the moving veneer to keep it flat all the way through the drier. The sprocket chain ends of these rollers are shown in Fig. 7, and the star gears ends in Fig. 8.

Supplementary conveyors to the inspection and gluing departments are often provided at the outfeed end of roller veneer driers in Douglas fir plywood mills, since the operation from the lathe to the glue room is practically continuous. Such a conveyor, with two interesting right angle turns, is shown in Fig. 9, serving the outfeed

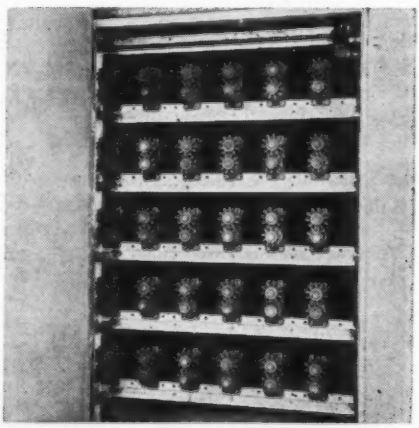

Fig. 8. Star gear side of Coe veneer drier.

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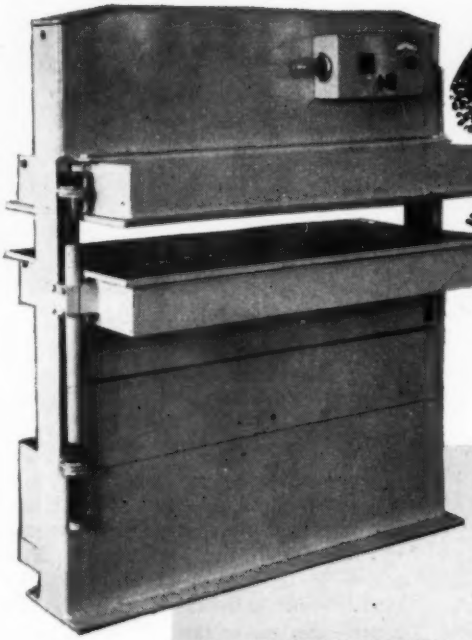

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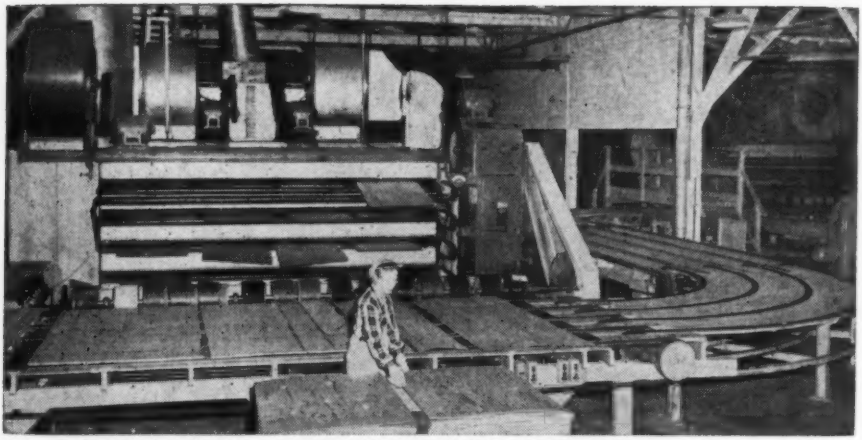

Fig. 9. Outfeed end of Coe veneer drier, with "S" shaped conveyor.

end of a three-deck roller drier. This conveyor transfers the veneer, as dried, to the next process department, which is usually inspection and clipping.

While these large multiple deck roller driers are primarily designed for a large production of rotary cut veneer, they are equally adaptable to thin veneers and sliced face veneers.

Roller Conveyor Driers With Dual Speed Regulation

The roller driers, so far described and illustrated, have had a single speed control, and were only adapted to drying one thickness or species at a time, in all of the drier belts, since all layers of veneer were advancing at the same speed.

Another maker of roller driers, of similar design to those mentioned above, has provided an unusual modification in this design, for a six-deck drier, which is illustrated in Fig. 10. This modification consists of a split speed control device, so that the three upper decks can be run at a different speed

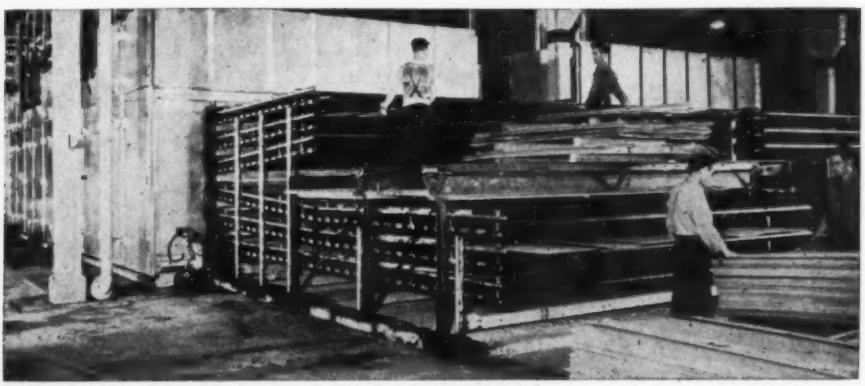

Fig. 10. Moore veneer drier with dual speed controls.

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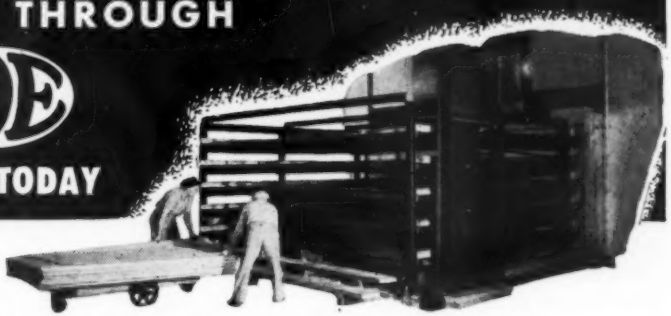

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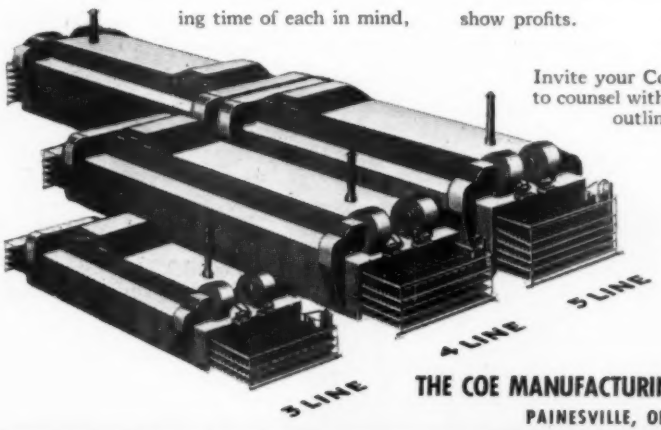

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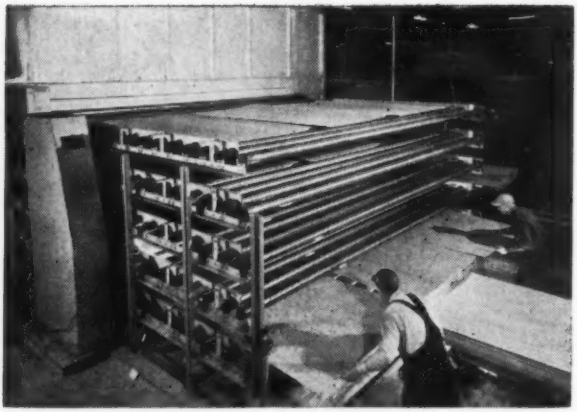

Fig. 11. Moore veneer drier with single speed control.

from the three lower decks. This permits two species or thicknesses of veneer to be dried simultaneously. It is to be noted in the photograph that one loading crew serves the upper decks and another the lower decks.

This is a particularly convenient arrangement in many veneer mills, since it permits drying the thicker core (center veneer layer in the plywood) and the thinner face and back veneers at the same time, and delivers them at the inspection department together, and in relative quantities required for gluing. This avoids the clumsy accumulation of a large amount of thick center veneer, without faces and backs, followed by a shifting of a single speed drier for the thinner outside veneers, drying and accumulating enough faces and backs, and repeating the procedure indefinitely. In most cases the outer veneers are about half the thickness of the inner layers, and therefore twice as much footage is required. Since the thinner veneers can be dried about twice as fast, the combination practically eliminates piling and storage at the inspection department, and results in a distinct conservation of floor space.

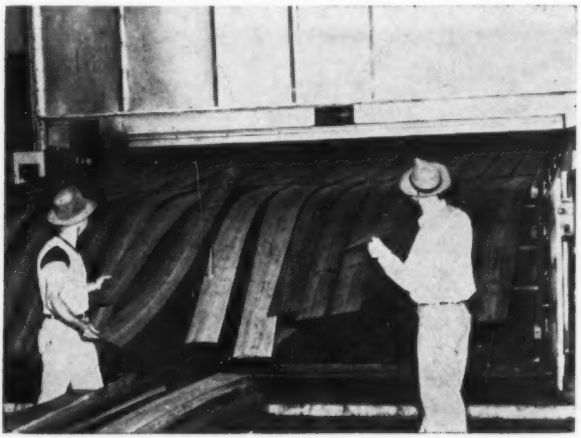

Fig. 12. Moore veneer drier for sliced redwood veneer.

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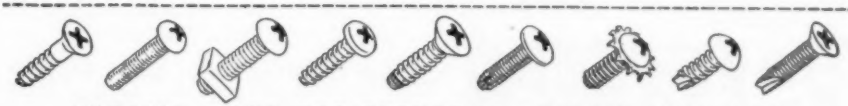

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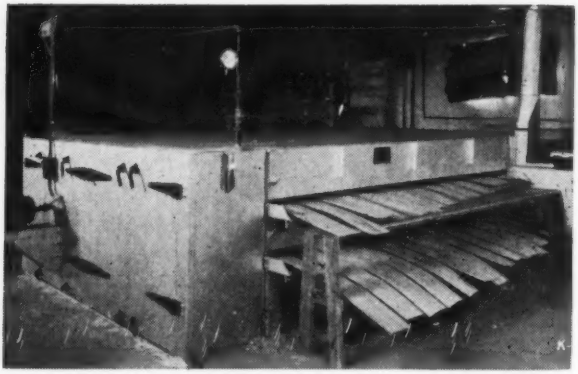

Fig. 13. Small roller drier (Coe) for redrying and flattening.

Another drying procedure that is facilitated by this dual speed control is the drying of sapwood and heartwood simultaneously, since the higher moisture content of the sapwood in Douglas fir requires about double the time needed for drying heartwood, when both are of the same species and thickness.

The addition of a cooling section at the outfeed end of the drier shown in Fig. 10, will substantially reduce the time required between the drier and the inspection and clipping department.

The contrast between the single speed and dual speed drier is shown in Fig. 11, where the single crew must be located on a lift to serve the six decks,

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the upper layers of which would normally be out of reach. There would be many instances in which a single crew could not keep all six decks full, and the drier might be operating substantially below its full drying capacity.

The use of a roller veneer drier for sliced face veneers is shown in Fig. 12, which illustrates a four-deck machine, where each deck is used for a single flitch, starting at the left hand side of the infeed end, as is shown in the photograph. This permits the reassembling in sequence at the outfeed end of the drier. It is also to be noted, at the lower left, that the flitches of green veneer are in four piles, one for each deck. The two top decks are in the process of loading, while the veneer on the two lower decks is moving ahead to clear the charging space for loading them after the top decks are filled.

It should be observed that the roller driers, illustrated in Figs. 10, 11 and 12, are provided with cross circulation units, which permit the regulation of temperature from a low initial point as the veneer enters, to a higher temperature when the veneer leaves the drier. The surplus moisture laden air is discharged, under damper controls, through top ventilator stacks.

Veneer Redriers

Redriers, mentioned as the second major type of veneer drier, in contrast with the initial drying of green veneers, have two principal objectives: (1) the final drying of veneer, previously reduced to some 10% to 12% m.c., for shipping, until it is suitable for gluing; and (2) flattening veneer for face matching or for tapeless splicing. Shipping dry is likely to vary, up or down, due to conditions encountered in transportation or storage and must be brought to an accurate moisture con-

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tent for hot press gluing, some 3% to 5% m.c., or for room temperature (cold gluing) work with urea resins, which should test around 6% to 7% m.c.

Platen redriers, with alternate day lights, opening and closing as veneers are charged and discharged, have been extensively used for such work, but they are no longer manufactured.

Some plywood operators use a conventional hot press for this purpose, during off hours when not required for gluing. Packs of veneer, about ¼" thick are loaded in each platen, closed with only nominal pressure, and left in the press for two or three minutes.

A small roller drier unit is now available for such work, and is illustrated in Fig. 13. This has two decks with cross circulation, usually with four recirculating fans, two in each direction. The usual cycle is from two to three minutes, at temperatures from 250° F. to 300° F, although a longer cycle or a higher temperature may be required for thick veneer. Such a redrier is almost indispensable in any plywood factory, and can be pressed into service for almost any type of emergency drying, such as short runs which do not justify the use of a larger drier.

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Conclusions

Readers will observe that there is considerable diversity in the types of veneer driers described, as well as in the drying techniques which are recommended. However, all types of veneer driers are adequately equipped with devices for controlling heat and ventilation, and for regulating the rate of veneer movement.

The addition of a cooling chamber at the outfeed end is particularly important in large drier installations, where the stock flows as rapidly as possible from the lathe to the gluing department and the hot presses.

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It is obvious that the operator of any veneer drier must be thoroughly trained in the techniques of efficient and economical veneer drying. In other words he must understand the various requirements of the species in use, their normal moisture content when freshly cut, the effects of veneer thickness and the range of moisture content permissible for the adhesives and press operations.

Since space does not allow detailed descriptions of many phases of design, construction and operation in veneer drying, interested readers are referred to the following manufacturers of veneer driers for more explicit information. These companies have been helpful in supplying the data and photographs for this article:

Coe Manufacturing Company, Painesville, Ohio

Moore Dry Kiln Company, North Portland, Oregon

Proctor & Schwartz, Inc., Seventh St. & Tabor Road, Philadelphia, Pa.

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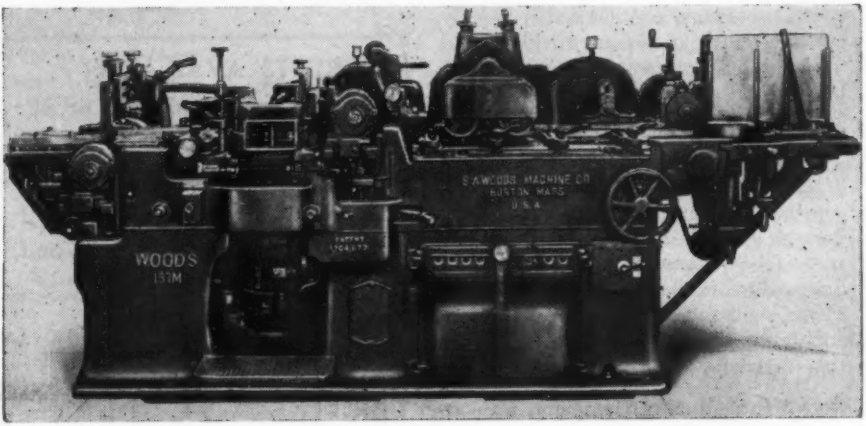

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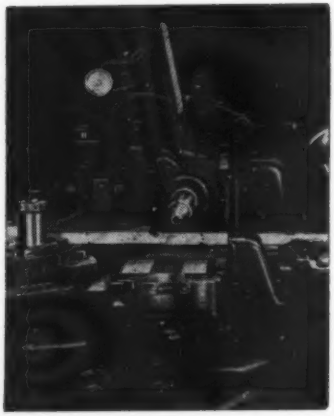

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VENEER and PLYWOOD

A Door and Its Core

By Ned Bailey

SEVERAL years ago we attended a meeting of the Wood Products Division of the A.S.M.E. at Madison, Wisconsin, home of the Forest Products Laboratory. It was one of the most interesting and forward looking meetings we have ever attended and the most serious.

At that meeting a paper was presented on the then rather new subject of honeycomb cores. The material had been under test for various uses including cores for plywood skis. It was brought out that if and when adhesive materials and fabrication techniques were further perfected wall, door and other structural applications would be developed, provided also that the cost of manufacture could be held down so as to be competitive with other materials.

Much experimentation, research and testing have been made, and honeycomb plywood is in general use as a result. To achieve balanced construction in wood is largely dependent upon scientific control and upon the absorptive nature of the wood being used. It is easy to understand, therefore, that when any single unit of wood in a built-up construction is not related to those combined with it, its reaction under the changes of moisture or temperature will be greater or less than, not the equivalent of the adjoining wood. Stresses are produced under this condition which cannot help but throw the construction out of balance, resulting in warping and twisting. To counteract these stresses caused by the independent reaction of the various wood parts, it is well to reduce the number of these parts to a minimum. Furthermore it is imperative to exercise careful moisture control during the entire manufacturing process.

According to the Weisberg-Baer Company, a firm which has made many and extended experiments in this field before proceeeding with the manufacture of this type of product, this control includes stress-free kiln drying and the milling of vents on the top, bottom and center rails to permit circulation of air to equalize the core for dryness, humidity and temperature changes. Management believes that added insurance is provided by URAC resin adhesive 185, claiming it to be a gap-filled

Lumber for the Weisberg-Baer Co. arrives by barge at the company's plant beside the East River in Long Island City, N.Y.

bonding agent which is stable in that it is not subject to change under varying moisture or temperatures.

The engineers in the flush door department at the Weisberg-Baer Company plant believe that a cold setting, urea formaldehyde type resin, such as URAC 185 produces a stronger, more durable and flatter door. Their experience has shown that, having a low moisture content, the resin decreases the moisture locked in the door during manufacture and thus increases the door's resistance to warping, checking and cracking.

Here grids of corrugated board are assembled. Weisberg-Baer's exclusive compressed-core construction is based upon this grid of 3-ply, double faced corrugated Kraft board, cut 1/16" higher than wood frame.

One of the difficulties experienced in the development of the honeycomb plywood flush door was finding an adhesive that really "stuck" to the cross-sections of the honeycomb. Weisberg-Baer Company has found that when spread URAC 185 is unique in its adhesion to the narrow cross-sections of the honeycomb-3 ply corrugated board grid core without excessive running or waste. This core which is the basis of the firm's exclusive patented compressed core construction is cut 1/16" higher than the wood stiles and rails. MacMillan Clements, P.O. Box 4, Danbury, Conn., is the inventor of this construction.

After faces of Masonite are applied, doors are laid up and clamped 24 at a time under 100 lbs. per square inch hydraulic pressure. This pressure compresses the 1/16" grid extension against the door faces insuring a flat uniform bond. The "beaded" squeeze-out of the glue line provides an additional craze-

Pre-cut rails and stiles of clear, kiln dried ponderosa pine or fir are assembled in pneumatic jig which holds frame square. Parts are joined together by corrugated wood fasteners.

resistant T-shaped glue reinforcement for the door. This spread with its "beads" is shown in one of the illustrations.

To store its supply of adhesive the company, in cooperation with American Cyanamid engineers, designed a giant 6,000 gallon tank, divided into two 3,000 gallon compartments. On the ground floor, the tank supplies the resin by vacuum pressure to the door assembly room three floors above, where the outlet is conveniently near the glue spreader. To have an instant flow of resin, the operator needs only to turn the valve by hand.

Before Weisberg-Baer placed the Airo-Door on the market, these doors passed tests by the Housing and Home Financing Agency in conjunction with the Forest Products Laboratory at Madison, Wisconsin. These experiments attested to the flatness and stability of the door. This manufacturer made many other tests such as soaking, exposure, shearing and tensile; through all of them the bond between the corrugated board grid and the tempered Masonite faces remained strong, no indication of failure of the bond was observed at any point.

An interesting "on-the-job" test further indicated the door's strength and durability. This is called the "slamming" test, something that may happen even in your house.

Three full size doors were "slam-tested" in an automatic device which slammed the doors shut with extreme force 24 times per minute—11,525 times per eight hour day. To convince themselves, the company carried on the eight hour slam cycle for eight days. In an ordinary home it was estimated that a door is usually slammed 20 times a day in normal use. The eight day test they made therefore equalled approximately 14 years of actual service. Although the automatic device slammed the door shut with infinitely greater force than normally employed, no apparent weakening or defects were found.

There used to be a saying in the woodworking industry that "if a method or machine was good enough for dad it is good enough for me." This 54-year

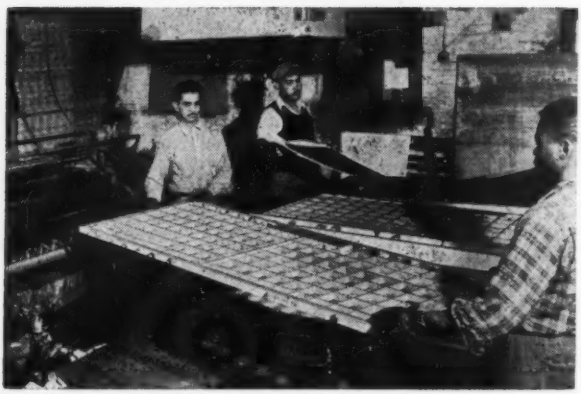
Outlet for the adhesive is conveniently near glue spreader. Operator needs only to open valve to have instant flow of resin.

Corrugated grids are placed in door grille before unit goes through revolving glue spreader.

old company does not practice this slogan. It is typical of the change that has come over the industry in the last decade or so. Ideally situated in Long Island City on the East River across from Manhattan Island, the firm maintains its own dock where the lumber on arrival is kiln dried down to an 8% moisture content. Proceeding to the fully equipped milling room, the cured lumber is cut into stiles, rails and lock-blocks for the Airo-Door; the Silendor, which is a sliding closet door; and the Airo-Panel, a prefabricated wall panel. All of these items feature the same compressed core construction.

Airo-Doors are used exclusively for interior flush doors in many outstanding modern homes and apartment house developments. Among these developments are the famous Levittown on Long Island, which has a population of about 60,000, and the new Levitt home group Steel Town near the Fairless Steel Works in Pennsylvania. The builders and developers of these properties, Levitt & Sons, Inc., tested these and other doors thoroughly and on the basis of the test results they placed the order with Weisberg-Baer for these bonded doors for every room in both developments.

Windsor Park at Bayside, Long Island, N.Y., and the huge Schwab House, a new apartment building occupying an entire square block along New York

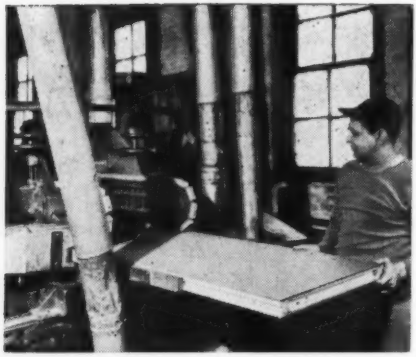


As unit emerges from spreader, the spread of adhesive is seen before Masonite faces are laid on. This water resistant adhesive adheres to the small cross sections of the grid without excessive running or waste.

Doors are laid up and clamped 24 to a press under 100 lbs. per square inch hydraulic pressure. The 1/16" extension of grid above the stile is compressed against Masonite faces, insuring a flat uniform bond.

After four hours of pressure in clamps, doors are removed and are ready for trimming.

This pre-fitting operation eliminates need of further fitting and trimming at time of installation.



Doors are accurately square edged to finished size. A double end tenoner trims the vertical sides, and a cutoff saw trims ends.

City's Riverside Drive are among others whose managements have gone on record to say that the excellent design and construction of these unique honeycomb doors are giving splendid service.

We wish to express our appreciation to Norman L. Prince of the Plastics & Resins Division, American Cyanamid Company and the Weisberg-Baer Company of New York for much of the material and illustrations used in this article.

Yes, the prophesy made at Madison several years ago has come to pass. Flush doors are becoming more popular every day, honeycomb-cored ones included. This high grade durable flush door is meeting the demand for lower cost housing through the elimination of waste and by providing a quality product with balanced construction.

Again adhesives have been produced that meet a need and advanced materials, machinery and techniques have been joined successfully in the Airo-Door.

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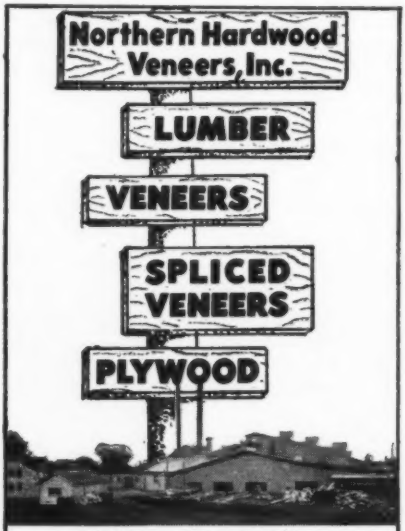

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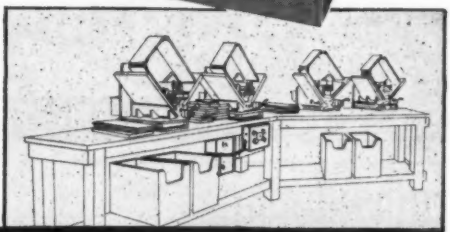

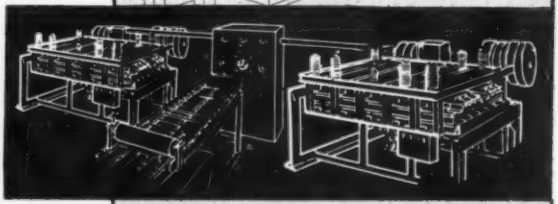

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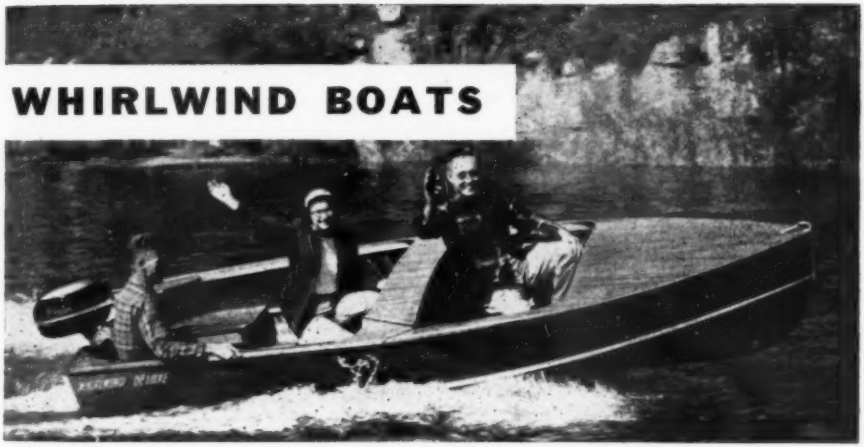


From Layers of Thin Veneer

AT the forty-third National Motor Boat Show, held in New York's Grand Central Palace in January, boats of practically every description were on display. They ranged from a 55' luxury cruiser with a price tag of $73,000 to a tiny pram, supplied in kit form for assembly at home for $39.00. Between these extremes were fishing dories, sail boats, racing shells, canoes and scores of craft designed for use with outboard motors—the types of boats which always make up the greater number of entries in a show of this kind.

It was evident that a number of different materials are used by modern boat manufacturers. There were aluminum boats, all-steel boats and boats made of layers of glass fiber sheet, laminated with synthetic resin. Yet wood, the boat builder's favorite material since the first crude canoe was hollowed from a solid log and launched centuries ago, is obviously still the first choice of most of the makers of boats.

Some of the hulls were constructed in the traditional manner of laying up solid planking over an intricate framework. Such boats are either "clinker-built," in which case the edges of the planking overlap, or "carvel-built"—having the planks butted together edge-to-edge.

There is an increasing tendency, however, among many modern manufacturers, to use plywood or thin veneers instead of solid planking for the boat's hull. This type of construction became possible with the introduction, some years ago, of modern waterproof resin adhesives—materials such as Rohm & Haas Company's Amberlite bonding resins—and it enables the boat maker to build exceptionally strong craft with a marked reduction in weight.

Two Techniques

Either of two basic techniques may be used in building boats of veneer wood. In one, standard sheets of marine plywood are cut and fitted to a frame—a modified version of the same frame as is used when the hull is made of solid planking. In the other, strips of thin veneer, coated with the adhesive,

The mahogany strips are passed through a glue spreader which coats them with resin adhesive. They are then placed on racks, shown in background, to dry.

are assembled over a form or mandrel and bonded into a single shell of wood under heat and pressure. In this process, no frame is required and the builder is not restricted in his design of the lines of the boat by the limits of curvature of a sheet of flat plywood. When the thin strips of veneer have been bonded together, this technique produces what is essentially a one-piece hull.

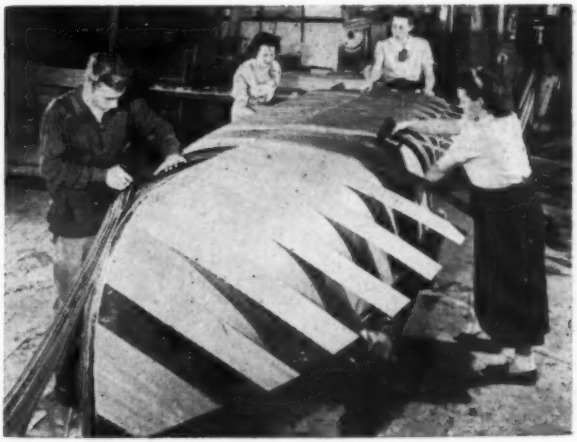
A leading manufacturer of boats produced by this molding technique is Molded Products, Inc., Cockeysville, Maryland, whose boats were displayed in the New York show under their trade name Whirlwind.

The Whirlwind line of boats includes some 14 different models—from a 12′ "Fisherman" weighing a scant 150 lbs., to a classy 16′ deluxe runabout with two cockpits and a long, rakish, bow deck. All the deluxe model Whirlwinds are easily fitted with a wheel for forward steering of the outboard motor. The larger boats—the 14′ and 16′ models—carry 35 horsepower motors with ease, and have plenty of strength to withstand the pounding of rough water when operated with the throttles of these big motors wide open.

Building a Whirlwind

The interesting operation of building a Whirlwind boat in the Cockeysville plant begins with the preparation of the veneer which is shipped in from nearby veneer-cutting mills. The 1/16″ thick Philippine mahogany is delivered in bundles in which individual sheets may vary in width from 6″-20″, and in length from 6′-16′. For building a boat, strips of from three to five-inch width are needed, and they should be from four to five feet long, depending on the size of the boat to be built. A preliminary step, therefore, is the cutting of these larger sheets to size. During this clipping and trimming operation, the veneer is sorted for grain pattern, the more attractive configurations being set aside for use on the faces of the hull.

Since the hulls are built up to a thickness of either 5/16″ or ⅜″, the larger boats have the thicker hulls, each boat will require either five or six



In the step known as "wrapping the mandrel," the Amberlite coated strips are stapled to the surface of a wooden form. First, alternate strips are tacked in place, then overlapping, intervening pieces are trimmed to a tight, flush joint and stapled down.

layers of the veneer. All the strips that will be used in a single boat are cut to the required size as a group and are kept together from the time they leave the trimming knife until they have been fastened in place on the mandrel.

Coated with Amberlite

Molded Products, Inc., uses Amberlite PR-14 as the bonding agent for all the veneer layers. This phenol formaldehyde product, developed in Rohm & Haas Company laboratories for such applications, offers a number of advantages. The fine powder is readily dispersed by either water or alcohol to form a liquid of the proper consistency for use in the glue-spreading machine, and the prepared mixture maintains good flow characteristics over a long period of time. After application to the wood, the resin may be left in the uncured condition for several days, if need be, without affecting the strength of the bond.

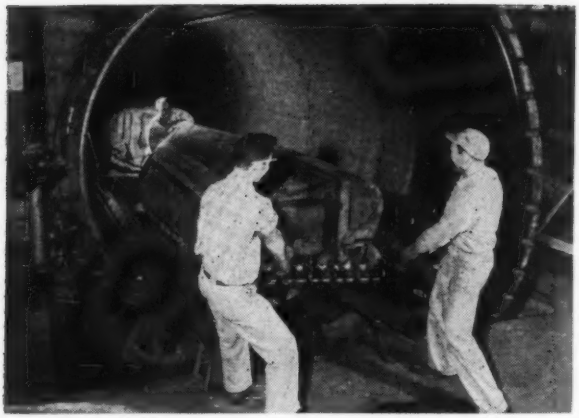
In making a Whirlwind, the Amberlite resin is applied to both sides of all the mahogany strips except those which are to be used as face veneers. These are coated on one side only. After coating, the strips are spread out on a rack to dry, and they remain on the rack until they are needed—ordinarily the next day.

Wrapping the Mandrel

The mandrel is a solid wooden form having the exact contour of the inside lines of the boat. A separate mandrel, therefore, is required for each boat of different size or contour. The operation in which the mahogany veneer strips are placed in position on this wooden form is known as "wrapping the mandrel."

A layer of cellophane is first placed over the form to prevent the strips from adhering to it during the bonding process. Then the inner keel—a strip running lengthwise along the center of the bottom of the boat—is inserted in a slot provided along the "top" of the mandrel (since the boat is assembled in upside-down position) and the inner stem is inserted in a similar slot at the bow. The keel and stem provide fixed points for attaching the veneer in the wrapping of the mandrel.

The first layer of veneer is placed on the mandrel at an angle of 45° with the inner keel, and the individual strips are clipped at this angle on one end. Staples, applied with a stapling gun or



Removing the mandrel, encased in its rubber bag, from the autoclave. In this pressure chamber, live steam causes the resin on the veneer to flow, penetrating every crevice of the mahogany.

tacker, are used to hold the strips in place as they are drawn down closely over the wooden form.

Each strip must be trimmed to make it fit the contour of the mandrel. Sharp tailoring knives are used for this trimming, and the wrapping operators become expert at slicing the veneer to the exact width needed with a single deft stroke of the knife.

When the mandrel has been completely covered with the first layer of veneer, the staples (other than those along the keel and stem, and the row that lies outside the trim line along the boat's gunwale) are either removed or clipped in the center so that they may be withdrawn from the inside of the boat after molding.

The second layer of veneer follows the same pattern as the first except that it is applied at right angles to it—that is, at 45° in the opposite direction along the keel. Also, each successive layer is started on a different line along the keel so that there will be an overlapping of veneer, even over the keel and stem of the boat.

Sub-assembly of a center deck for a deluxe Whirlwind. The parts are bonded with Amberlite PR-115, resorcinol adhesive, which provides a strong, water resistant joint.

Installation of the forward deck on a Whirlwind Standard. The ribs and gunwales are coated with adhesive and the deck is attached with monel Anchor-fast nails.

The crisscross pattern is repeated in layer after layer, until the required thickness has been built up. Every strip of veneer in each layer has to be carefully fitted to form a tight butt joint against the adjacent strip, and it must be stapled securely in position. Then, as each new layer is applied, the staples in the preceding layer must be removed. The punctures left by the staples in the mahogany are so tiny that the wood would tend to seal itself, but the resin, flowing into every pore of the veneer during the bonding cycle, does the job surely and positively.

Bonding

Bonding is done by what is known as the rubber bag technique in a steam heated pressure chamber. The veneer wrapped mandrel is covered with canvas (to protect the rubber bag from chafing damage) and the long rubber envelope is then drawn over the entire assembly.

In view of the weight of the mandrel —roughly the equivalent of a section of a tree trunk of dimensions corresponding to the length and width of the boat—the job of getting the mandrel into the rubber bag is a major operation. It is accomplished with the aid of jacks and dollies, and the open end of the bag is then clamped to provide an air tight seal. The covered mandrel, resting on a low truck, is pushed down the track into the autoclave—a chamber that is some 30′ long and 9′ in diameter—and the door is bolted shut.

Air is withdrawn from the rubber bag by vacuum line which remains attached to the assembly throughout the curing process. Then steam is turned on to produce the heat and pressure needed for the cure. Forty-five minutes under steam, with the temperature held at 270°F, is the cooking or curing cycle used at Molded Products, and during this time the Amberlite resin melts and flows into every opening of the veneer assembly. It then hardens and sets into a permanently waterproof, inert compound.

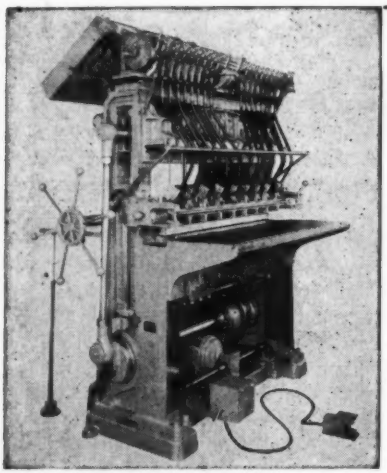
After the cooking is completed, the mandrel is withdrawn from the autoclave, the rubber bag and the canvas are removed, and the hull is lifted from the mandrel. This step is not as simple as it sounds, for the veneer is molded so tightly to the contour of the mandrel that pry bars and jacks are required to loosen it.

The molded hull is carefully examined and any remaining staples are removed. Edge joints on the outside of the hull are then puttied, and the entire outside is thoroughly sanded.

While the hull has been in process, other manufacturing operations have also been going on. Transom boards, which close the open stern of the hull and provide the mount for the motor, are prepared by bonding a mahogany face veneer to one and one-eighth inch thick marine fir plywood. For this gluing operation, and for various other

bonding requirements in the final assembly of the boat, Amberlite PR-115, unmodified resorcinol, resin adhesive is used. The transom boards are cured in a hot press to speed the operation. In certain other steps in the boat assembly, where clamps or screws can be used to hold the parts in position conveniently, the Amberlite PR-115 may be allowed to cure at room temperature. The resin adhesive, prepared for use by mixing with Rohm & Haas catalyst P-117, and cured at clamping temperatures of 75°F, develops the joint strength, moisture resistance and durability usually associated only with hot press phenolics.

Careful attention to the fine detail which will insure a high quality, dependable product is evident in every step of the manufacturing process at Molded Products, Inc. For example, the outside splash rail and the inner rail (on which the seats are mounted) are attached in the same position on the hull in order to provide maximum strength. The white oak outer rail is first attached, using Amberlite PR-115 and brass screws that are driven through from within the hull. Then the inner rail, also coated with Amberlite PR-115, is placed in position over these screw heads and attached by long brass screws, driven through the hull and into the spray rail. The outer keel and the outer stem are fastened in their respective positions in a similar manner. The outer keel, incidentally, is tapered at the back to prevent "rooster tail"—a spray of water thrown from the back of the boat in motion that tends to interfere with the operation of the motor. The outer stem is shaped to bring the "fair lines" of the boat to within half an inch of a knife-edge along the bow, giving a practically perfect sweep of unbroken line from one end of the craft to the other.



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Paint and Hardware

After the assembly is completed, the boat goes to the paint shop. A standard paint job consists of spar varnish on the inside, over the outer decks and from the spray rail up on the outside. Below the spray rail, the hull is painted in one of four colors—red, shamrock green, marine green, or white on the current models.

The final step, when the layers of paint and varnish have dried thoroughly, is installation of the hardware. Standard hardware is either aluminum or bronze, and includes lifting handles —two at the stern and one on the bow— along with bow and stern strips. Each boat also carries a serial number, stamped deep into the hardwood transom knee. The same number is on a production card giving the complete history of the manufacture of the boat, even to the identity of the person who attached the hardware. This card is kept on permanent record in the company's files.

Distribution

Whirlwind boats are sold by dealers throughout the east, midwest and part of the Pacific Coast, and they are exhibited in the major boat shows in these areas as well as in the big annual event in Grand Central Palace.

For the past two or three years, production at the Cockeysville plant has been unable to keep pace with the demand for the boats, and not every would-be purchaser of a Whirlwind has been able to obtain one promptly. An expansion program, now under way, will provide a much-needed enlargement of manufacturing facilities and a significant increase in production.

These Amberlite-bonded, mahogany veneer boats are trim, roomy and de-

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NEWTON CHUCKING CUTTERS are ideal for cutting square shouldered pins on wood parts such as chair stretchers and similar small parts where it is not practical to drill holes for dowel pins. These cutters will produce pins from ¼" to 1" in diameter and up to 2" in length. Pins can be cut at angles as well as straight. There are two sizes to choose from, both of which can be used on all NEWTON BORERS. They can also be used on drill presses and many other types of machines, or mounted directly to a motor shaft, if desired.

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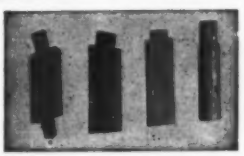
SAMPLES OF PINS & TENONS CUT WITH A NEWTON CHUCKING CUTTER



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you finer resin adhesives . . . quality controlled from their basic raw materials (RCI-made formaldehyde and phenol) to end product. And, in addition to urea-formaldehyde, phenol-formaldehyde and resorcinol resin adhesives, RCI also produces soybean and casein glues.

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pendable. They are stable and easy to handle, even in rough water, and they are easily maintained, for the molded hull requires no special care and no caulking or puttying is ever needed. There is a Whirlwind for every boating use—for fishing, cruising, family fun or even stock boat racing—and thousands of satisfied users, in many parts of the country, are enjoying these modern craft as they "whirl away in a Whirlwind."

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FOUR CUTTER MOLDING MACHINE

William Menkes, Woodworking Machinery & Tools, 15 Whitehall St., New York 4, N.Y., is representing a number of foreign made machines here in the United States. Literature about the machines is available. One four-page brochure describes a German made four cutter molder.

This four cutter planing and molding machine is well adapted to both the medium sized and small shop, we are told. One of the features stressed by the manufacturer is ease of changing setup. This means that small quantities of one type of molding can be made. The brochure completely illustrates all parts of the machine and explains the working principles. Dimensions for this open-side machine, which can use four or five working spindles, are also given.

FOX NAILER

A portable nailing machine—the Fox nailer—is described in a four-page brochure being offered by the Fox Nailer Corporation, 380 River Rd., Gladstone, Ore. This semiautomatic nailer will drive nails at any angle, we are told. It is possible to nail in confined places or in corners and it is easy to countersink with this tool. The nailer has only two moving parts and requires no lubrication.

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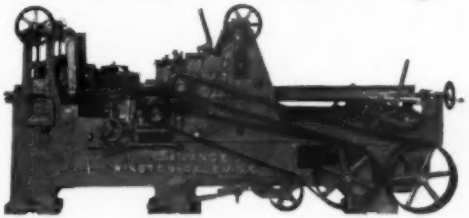

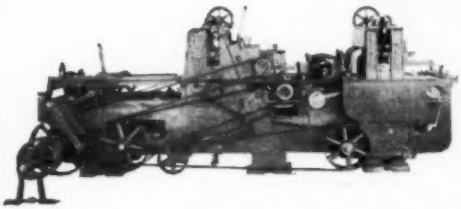

No. 67 Vance Double Surfacer and Matcher. Built with and without profiler. A modern machine of medium size, with round heads and ball bearings.

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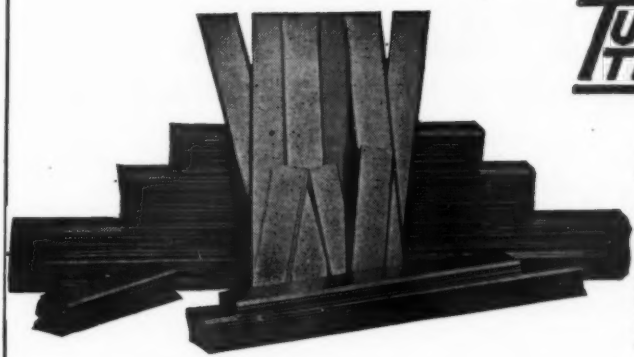

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Using the Router - Shaper - Planer

By Harold Neustadt

THE portable router is not new. Many professional woodworkers have had some experience with this tool which has passed widespread tests of acceptance and use. What most men are not aware of is that some of these tools use the same basic parts for a shaper or as a power plane, with simple interchangeable accessories.

Both Stanley Electric Tools and Porter-Cable manufacture a router-shaper-planer combination portable tool that converts from one basic function to another without the use of as much as a screwdriver. The same motor serves in three different tools. Since motors are the most expensive part of portable electric tools the economy effected by utilizing one instead of three motors is reflected in an over-all low cost.

In small school and cabinet shops, where budget and space limitations prohibit the use of heavy expensive power tools, the combination tool is worthy of some serious consideration. In large shops and factory setups the purchase of several motors, each with the three basic accessories, would permit a practical combination of any of the three tools to meet periodic job requirements. For instance, if so desired, three motors could be set up as three shapers, three routers or three planes; thus nine tools would be available with only three motors.

The Router

By means of a spiral thread, the motor slips into the router base. Bits and cutters are installed in a chuck and collet. On the Stanley machine the shaft is held stationary and the chuck is tightened with a single wrench; this is accomplished with two wrenches on the Porter-Cable tool. The bit is set to barely scratch the surface, by rotating the motor, and the depth is adjusted the same way. A ring, calibrated in 1/64ths, around the motor is used to figure the depth. A large thumb screw locks the motor in place.

Stair template used in cutting grooves for steps in stringers.

For the professional user the router is a handy tool for cutting grooves, dadoes, mortises and rabbets on straight or curved work. Sinkages for inlays and cutouts in Formica and linoleum sink tops are quickly made. With a variety of cutters the shaping of decorative edges, coving, chamfering, rounding, molding, veining, beading, V jointing, weather stripping of sash and doors

Fluting a turning with a Stanley shaper.

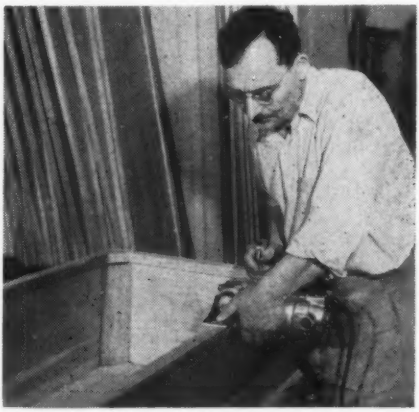
and numerous other operations are within its scope. With pilot tips to limit the amount of material removed from an edge with cutter bits, moldings can be added to assembled frames on either outside or inside edges.

With the help of a special template and bit dovetail drawer joints can be executed with neatness and dispatch in a fraction of the time required by hand or other machines. On cabinet and millwork templates and guides can be employed to save time and money.

The abrasive wheel is used in the motor to sharpen cutters and bits.

Templates produce quick top-quality results in door hanging work, both in the mill and on the job. Since the same template is used on the jamb that is used on the door, accuracy of fit is assured for the hinge leaf on each. Lock mortise and face-plate cuts can likewise be made with time-saver templates.

The stair template is used for both the layout work as well as the routing of tread and riser dadoes. It works on both string pieces because it is reversible from a right hand to a left hand position without disturbing the measurements. Anyone who ever had any stair building experience can appreciate



Speedmatic plane being used in manufacture of caskets.

the tremendous savings of time and effort which are otherwise necessary to mark both boards. With this template only two cuts need to be laid out; to get the pitch or distance from one tread and riser intersection to the next. Once the pitch line is established, from top to bottom, the template does the rest.

Fluting or beading turned members set in a jig is easy when the router motor is installed in a special shaping stand. Three lip cutter bits with a pilot tip or collars, to control the depth of cut, are used.

The Shaper

Used as a shaper to facilitate the cutting of molded, beaded or rabbeted edges on circular and irregular shaped pieces the router is installed, upside down, under a shaper table. The table is attached to a work bench with posts or brackets. The shaft projects through a hole in the table surface and router bits can be inserted in the collet and chuck or three lip cutters installed on an arbor. Collars are used to limit the lateral depth of cut.

For straight work a fence is used and curved pieces ride against a guide bracket. For repetitious work, patterns carefully prepared with the router or jig saw are run against a collar and the work is manipulated free hand. By

Speedmatic router grooving deck for bar in cabinet shop.

adding several cutters simultaneously with or without spacers, or resetting the height of single cutters and making two or more passes, an amazing number of interesting shapes can be produced with a small number of cutters.

Speed of 18,000 and 20,000 r.p.m. insures smooth moldings that are as good and better than those turned out on many bench type single spindle shapers.

Dovetailing drawer joints with a Stanley dovetail template.

The Power Planer

The combination tool uses the same motor, with its spiral thread, to power the plane attachment. As a lightweight plane it zips through wood at accurately set depths leaving an absolutely smooth, waveless surface which requires almost no sanding. The collet is replaced with a special high speed steel cutter that is wide enough to plane down a 1¾" door with ease. Bevels are easily set and are no harder to cut than square edges.

The gear type power planes have an advantage in having the motor mounted above the cutters. This makes it possible to plane large flat surfaces by overlapping the cuts. The bevel guide is removed for this operation.

With a bench stand attachment the power plane makes an efficient jointer. The plane cutter is used for square or beveled faces and shaper cutters can be installed to put decorative edges on straight work.

Equipped with shaper cutters, the power plane serves as an excellent molding plane. Besides shaped edges on straight work it can produce grooves and channels for weather stripping, in-

lays, etc., quickly with unsurpassed accuracy.

Sharpening

To keep the router bits and cutters in first class condition an abrasive wheel mounted on an arbor that fits into the collet can be employed. The motor is removed from the router base and held by hand to grind the bits and cutters.

Plane cutter edges can be kept razor sharp with a simple to operate attachment that accepts the motor without removing the cutter. The plane can be put back in action in a few minutes.

PLY-VENEER CONTAINERS

The Weyerhaeuser Timber Company, Tacoma, Washington, has placed a new product on the market. This is a container made of Ply-Veneer—paper and veneer sandwiched together. Basic ingredients of the Ply-Veneer flat stock are Kraft containerboard, made of Douglas fir chips by the company's Springfield, Oregon, pulp division, and specially processed fir veneer from the lumber division's new plywood plant.

The veneer is routed for folding, sandwiched between two sheets of glued containerboard, cut and shipped flat according to customer specifications. The containers are fastened by the customer either by taping, banding, stapling or nailing. Some types of Ply-Veneer cartons will have wood end cleats for still greater stability. The Ply-Veneer containers are tailor-made to customers' needs. A great variety of products can be shipped in the containers.

Clark C. Heritage, Weyerhaeuser Timber Company's director of development says:

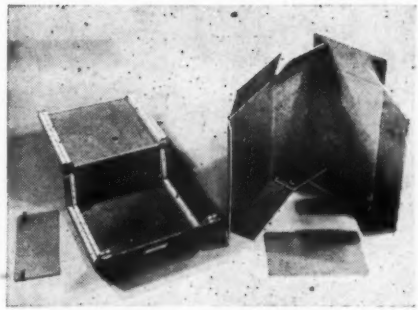
"With an unparalleled veneer treatment for flatness and stability, Ply-Veneer has all the advantages of wooden boxes and of corrugated fiber cartons without perpetuating some of their disadvantages. Ply-Veneer retains the stiffness and resistance to crushing of wood, plus the toughness,

Ply-Veneer is made of two sheets of Kraft containerboard "sandwiching" a layer of Douglas fir veneer. Here John Crosby, product engineer, displays Ply-Veneer's component parts, plus the steel straps which make for greater nail-holding ability.

impact resistance, strength, lightweight and smoothness of fiber containers. The result is an easily printed, easily handled container substantially more rugged than any other on the market today.

"Its stacking strength, gapless and slitless construction, and low-bulk factor for reshipping in 'knock-down' bundles are also to its credit. Ply-Veneer is remarkably water and moisture resistant and it performs well as a cold-storage container."

Weyerhaeuser development men most active in bringing Ply-Veneer from its research stage to regular production are R. D. Pauley, former development center manager who is now manager of the company's special products division; J. R. Roberts, development center manager; A. M. Fisken, project engineer; A. S. Gregory, assistant manager of the development department; J. L. Sheridan, process engineering section chief; and C. C. Clapp, company's project engineer, whose design of special combining machinery makes pos-



Ply-Veneer shipping containers.

sible a continuous and economic production line flow of Ply-Veneer blanks.

Ply-Veneer will be produced initially in a section of the plywood plant at Springfield, which is part of that branch's lumber division, managed by Jon. R. Titcomb. Approximately 50 men will be employed in this new section, first of its kind anywhere in the nation.

CHROMATONE REDWOOD FINISH

The Alumatone Corporation of Los Angeles, California, announces the addition of a new product, Chromatone redwood finish to its line of paint and finishing products.

Developed through many years of research and careful testing, the manufacturer states that Chromatone clear redwood finish is manufactured from highest quality materials, consisting of resin-free oils, with a 60% minimum solid content, and that it produces an especially tough, elastic, long-wearing, weather resistant finish. Although developed primarily for redwood, this new product will also produce a fine finish when used on pine, cedar, Douglas fir and other woods, both interior and exterior.

A companion product, Chromatone pigmented redwood finish is also available for use when a tinted sealer is required. This product dries flat, eliminating high lights and dull spots, giving a beautiful uniform finish. After using Chromatone pigmented redwood finish, if a glossy effect is desired, additional coats of Chromatone clear redwood finish may be applied.

FAST DRYING FILLER

A new, fast drying wood filler that can be recoated in 30 minutes has been announced by Barrett Varnish Company, 1532 South 50th Court, Cicero 50, Illinois.

Named Speedyfill, this new filler is as high in quality as the conventional overnight drying types. Because Speedyfill dries like lacquer and can be recoated in 30 minutes after applying in normal air dry conditions, finishing room travel time can be speeded up as much as 24 hours, thus increasing production while cutting work in progress inventory.

Although Speedyfill is available in any color submitted to match, it is regularly available in white, natural, red mahogany, brown mahogany and walnut.

DAVISON INTRODUCES VARNISH FLATTING AGENT

Introduction of Syloid 162, a new product for use as a flatting agent for alkyd-urea varnishes, is announced by the Davison Chemical Corporation, Baltimore 3, Md. It gives the matte, or hand-rubbed, effect desired in the finish of varnished furniture and in other important varnish uses, and is a companion product to Syloid 308, introduced previously by Davison as an agent for flatting lacquers. Both are synthetic silicas especially designed for the specific uses indicated.

LANGENAU SUPPORT NO. 1

A sturdy new all-steel support nail, designed to eliminate the breakage, scarring and marring characteristic of the old lead-head support nail has just been added to the shell hardware line at Langenau Manufacturing Company, Dept. WD, Cleveland, Ohio.

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Virginia Machine Tool Co.

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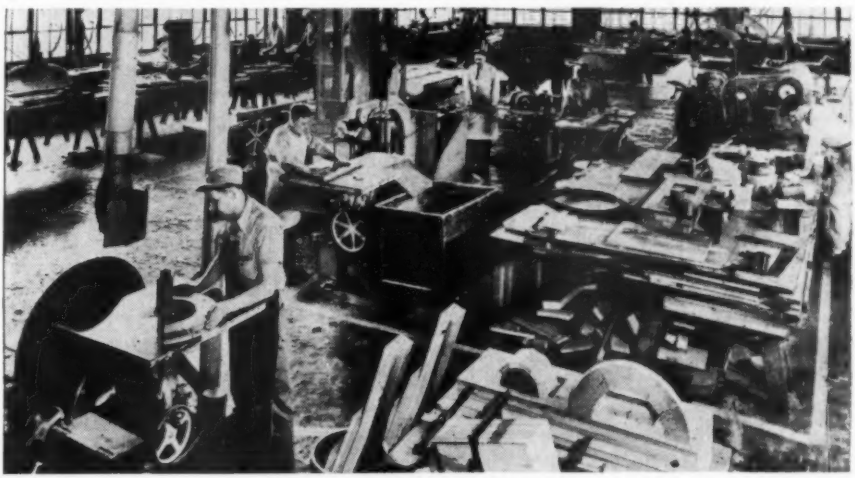
Precision-Made Tools For The Woodworking Industry — Standard or Milled to Pattern

PATTERNMAKING
at the
R. D. WOOD COMPANY

Patternmaking is a specialized field within the woodworking industry. This article describes the patternmaking shop at R. D. Wood Company, Philadelphia, Pa.

DESIGNING and building hydraulic presses and valves require the use of many varied skills and employ a wide range of industry specialists actually beyond the realm of hydraulics. R. D. Wood Company, at the main works, Florence, New Jersey, designs and builds hydraulic machinery and allied equipment. The firm utilizes the skills of many varied specialists, not the least important of whom are the patternmakers.

The pattern shops at this plant on the industrial Delaware play a vital role in making the full-scale wood or metal patterns used in the making of molds for the manufacture of castings—castings that represent the major components, at least size-wise, of these giant hydraulic presses and other products. The patternmakers at R. D. Wood Company have an average experience of 35 years with the firm. By necessity, their combined skills and techniques range from the fine art of cabinetmaking, tool and die making, through knowledge of metals. They are true craftsmen—and the end product reflects their work.



General view of a section of the pattern shop. Some of the modern woodworking machinery seen here includes: sander, band saw, planer and core box machine. The shop is equipped with a wood block flooring to absorb shock and reduce fatigue of the men working here.

This skilled patternmaker served his apprenticeship in England, and came to work for the firm in 1919. He is cutting coreprints to be attached to main portion of pattern. Note mahogany print glued to each joint of pattern. When complete, pattern will be used for standard bend.

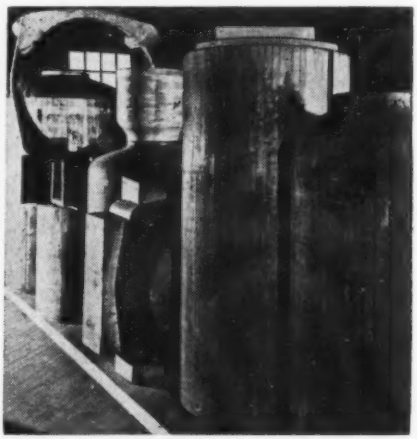
The pattern shop at this plant is, in effect, a modern woodworking plant. Its equipment represents the latest in woodworking tools—machinery that converts raw wood stocks into intricate components that will emerge eventually as hydraulic presses, valves, accumulators, intensifiers, alleviators and other hydraulic apparatus. Operating equipment in the shop includes band saws, sanding machines, lathes, planing machines, jointers, core box equipment and similar facilities.

The patternmaker's product is a full-scale model of a required metal casting—usually made of wood. Most large standard patterns and core boxes are made of northern white pine with strips of mahogany and metal facing at the joints. Other patterns, requiring a harder surface, are made of mahogany.

By necessity, patterns are made larger than the casting to be molded in order to compensate for shrinkage which occurs when the metal solidifies, and as an allowance for finishing and machining operations on portions of the castings. Certain metals vary in the degree of shrinkage which occurs. Thus the skilled patternmaker must be familiar with those qualities in the metals to be used.

The pattern normally is made in two halves. The top half, known as the cope, and the bottom or lower half, referred to as the drag. Those portions of a pattern that accommodate open areas, cavities, or channels within the inner confines of the casting are made by core boxes.

Initially, the pattern shop is furnished a scaled drawing representing the part or component which will eventually be molded into a casting by the foundry. Working from this drawing, a full-scale layout is made on large wood drawings or layout boards. It is at this stage of development that consideration is given to the aspects of: the proper degree of additional casting required for machining and finishing; the parting line or



Views of patterns in storage in one of several enclosed warehouses. Patterns in foreground are used for different diameter rams or for any casting requiring a pattern of its dimensions.

This patternmaker calipers a main section of flange pipe. The wood lathe brings the work down to proper size for insertion of flange. Clear mahogany is used on the joint for wear.

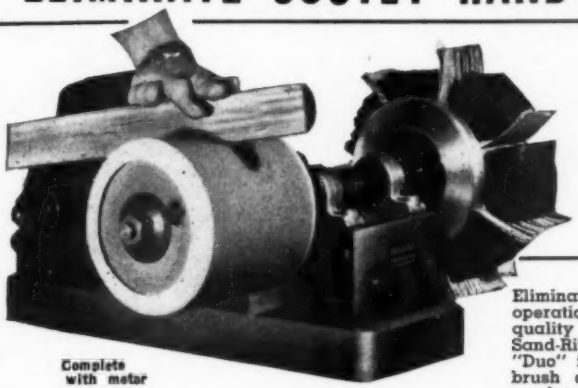
joint of the casting; the length of the core print and draft; and the allowance for shrinkage of the metal, etc.

The patternmaker then brings into play the modern tools of his trade, his hands, his skill, and his experience—experience that will reduce to a minimum the hand finishing and machining operations of the metal casting after the molding process, and in so doing, add materially to the efficiency and quality of the total operation.

The patternmaker builds and assembles the rough pattern and core box to an approximate finished size. These elements are then lathed, planed, sanded and worked down to precise scale size, constantly being checked against the master drawing. When completed, the pattern and core box are shellacked as a protective coating and scheduled for the processing operations of the foundry.

The facilities of the pattern shops are used for making new patterns, and for the repair, alteration and mainte-

ELIMINATE COSTLY HAND SANDING



Complete with motor

USE A SAND-RITE "DUO" SANDER

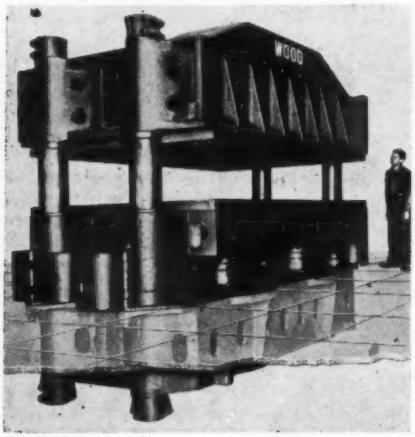
Eliminate costly hand sanding operations and maintain top quality finishes by using a Sand-Rite "Duo" Sander. The "Duo" is a combination rotary brush and pneumatic drum sander that can be used on all types of wood products of irregular shape and rounded contour. The flexibility of the "Duo" enables easy and economical operation. Almost any one is an expert after a few operations. Write for full information today.

SAND-RITE MFG. CO.

Dept. W., 226 W. Schiller St.
Chicago 10, Illinois

nance of patterns drawn from storage. After they have served their purpose as patterns for the casting molds, they are coded and stored in a dry enclosed warehouse for possible use and re-use. R. D. Wood Company stores approximately 22,000 patterns representing every conceivable casting used in the manufacture of their varied product line. Over half a million cubic feet of space, in several buildings, is devoted to storage.

The hydraulic machinery and allied equipment manufactured by this company require that patternmaking prac-



R. D. Wood press No. 8681. This is an 800 ton single opening multiple cylinder type up-working press used in the woodworking industry.

tices be maintained at their highest level. The tightness of the joints; the gluing and screwing of patterns and core boxes; the running of the wood grain in the proper direction to achieve maximum strength; the batton and proper size headers used to keep patterns from pulling apart during the molding process—these and many others are some of the controlling elements which contribute to the making of a good pattern.

The end product is a pattern that will play an important role in the fabricating and building of hydraulic presses and allied equipment.

BETTER WORK FROM EMPLOYEES

A new booklet, "The Incentive Story," revealing plans used by top companies to get people to do better work, is being offered to business executives by Cappel, MacDonald & Company, Dayton 1, Ohio incentive firm.

The booklet illustrates all phases of "incentive" planning, from conception to results; unveils a display of "prize-campaign themes" used by 44 leading companies; discloses secrets of actual prize-winning employees; divulges amazing case records of campaigns used by leading companies selling appliances, frosted foods, automobiles, dairy products, feeds, cameras, instruments, seafood, bakery goods, financing and insurance, regulators, paints, coffee, and carpets.

SELECTING GLUE

"How to Select a Woodworking Glue" is the title of Technical Note 256 recently issued by the Forest Products Laboratory, Forest Service, U.S. Department of Agriculture. Although it does not give brand names of glues, it lists and discusses four questions a woodworker should ask himself before buying glue.

During the past month the laboratory issued 4 other new publications, 3 lists of publications, and 18 revised technical notes.

"Comparison of Wood Preservatives in Stake Tests (1953 Progress Report)," Rept. No. D1761, gives results of stake tests of 47 different preservatives after 9 months to 14 years of service. Some tests of the decay and termite resistance of staypak, papreg, impreg, compreg, and acetylated wood, all modified wood or paper plastic products, are also reported.

Report No. R1942 is part of a series of information leaflets on foreign woods. It describes courbaril, a species native to the American tropics. Courbaril is used locally in its growth regions for mill machinery, ship and boat building, furniture, cabinet work, construction of all kinds, interior trim, and turnery. Very little of it is imported into the United States.

In cooperation with the Air Force-Navy-Civil Subcommittee on Aircraft Design Criteria, the Laboratory issued a report on "Evaluation of Vacuum-induced Concentrated-load Sandwich Tester," Rept. No. 1832-B, and a "Supplement to Mechanical Properties of Cross-laminated and Composite Glass-fabric-base Plastic Laminates," Rept. No. 1821-A.

A revised "Partial List of Government Publications of Interest to Architects, Builders, Engineers, and Retail Lumbermen," was issued as Rept. No. R1081.

Available Government publications on wood finishing subjects are listed in Rept. No. R454, and those on mechanical properties and structural uses of wood and wood products in Rept. No. R200.

Copies of these publications may be obtained free by writing the Director, U.S. Forest Products Laboratory, Madison 5, Wis.

ACCIDENT PREVENTION

The National Safety Council's new "Handbook of Accident Prevention for Business and Industry" is a convenient safety guide for the manager of a small business or the supervisor of a department in a large organization. It is available from the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

The handbook shows how to set up and maintain a safety program. Detailed information is included on subjects such as plant lay-outs, materials handling, housekeeping, machine guarding, electrical hazards, pressure vessel hazards, first aid, fire prevention and personal protective equipment.

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I'M a druggist. Offhand it might seem my business is far removed from forests and tree farming. Actually, it isn't. The new wealth created by forest crops and the products processed from them is vitally important to my drugstore and to the business and industries that provide income and employment to my customers. That's why I say be careful with fire in the woods.

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KILN DRYING
at the John Widdicomb Company

By Stephen D. Price

Modern demands for large production without sacrifice of quality have keynoted industrial practices universally. The furniture industry is no exception. These demands have brought forth improved kilns, kiln schedules, adhesives and bonding equipment which have in turn altered much of our thinking and practice in the seasoning and subsequent moisture control of our material in storage and process. The author's company has met these changes with good kilns, imaginative (modified) schedules and practical moisture control measures within the plant.

IT IS interesting to note the changes which have taken place that make today's discussion of kiln drying and moisture control in a furniture factory different from a similar discussion five to ten years ago. Changes that have been forced upon us provide the answer to the frequent question, "We never had to do it before, why now?"

Many changes have come and they in turn have necessitated new procedures. These changes have forced much of the furniture, as well as other woodworking industries, to cast off the artistic, rule-of-thumb concept of lumber seasoning and moisture control and take a more scientific attitude.

The factors bringing about changes in this field are closely associated with the ever increasing need for greater production. These are: (1) the increased demands for consumed goods; (2) ever increasing labor and material costs; (3) larger fixed costs and overhead; (4) need and desire for more rapid capital turnover.

Specific changes or advancements in equipment and materials designed to satisfy this production pressure are: (1) development of forced draft kilns with automatic controllers; (2) expanded and diversified use of synthetic resin adhesives; (3) development and acceptance of bonding equipment, i.e. hot presses, high-frequency bonding equipment and tapeless splicers.

We all recognize the first group as the theme of our industrial society. Our attention here will be on the specific changes this has prompted and the manner it reflects on the subject at hand.

Fan Kilns

Fan kilns date back to the early part of this century, but their general acceptance by the furniture industry has come only in the last few years. This acceptance of new equipment brought with it new and more radical thinking with regard to the kiln drying of lumber and, in turn, brought forth a new type of kiln man, an operator who thoroughly understands his equipment and adjusts his thinking with regard to new schedules and correct use of total kiln facilities.

A sizeable number of these men have taken their training at the Forest Products Laboratory at Madison, Wisconsin, or learned from such men and/or from literature released from that prime source. Many others are kiln company trained. Most are wide awake, open-minded, full-time operators—they have to be.

The acceptance of fan kilns has changed methods of air circulation and kiln control, reflecting on both rate and quality of drying and initial moisture condition of stock handled.

Synthetic Resins

Interior service moisture standards for wood have in the past dictated and still do dictate the proper moisure content of wood being processed. However, a new and more exacting approach has been introduced with the use of synthetic resin adhesives. These resins have materially altered the degree of kiln drying; that is, the allowable minimum of moisture content to which the stock should be reduced.

Previous practices of drying to a "bone dry" condition are no longer valid, and if allowed can be damaging, particularly with regard to the strength and durability of bonded members.

Panel assembly and blocking with casein, vegetable and animal glues called for mixes that comprised from 1½ to more than twice as much water as glue solids. Setting was essentially by moisture loss. This glue-line moisture was a factor in conditioning the panel to service conditions.

This is not true with resins. Formulations now call for a resin-to-water ratio of approximately 2 to 1, with water a chemical element of the whole which is essential to the complete polymerization or cure of the adhesive. Wood moisture plays a part by aiding this reaction or at least by being present in such an amount that moisture is not rapidly drawn from the glue line, thereby allowing it to take its part in completing the necessary chemical reaction.

Not only do the uses of resin adhesives dictate, at least in part, the material moisture content limits, but also, they demand a more exacting control of plant conditions to maintain the stock within limits.

Once dried, lumber and veneer must be held within the required moisture content range while awaiting the gluing operation. Also, parts must remain as close as possible to the acceptable moisture content at the time of machining so as to assure close joints and satisfy the space filling intolerance of these resin adhesives.

Most practices must allow some time to elapse between machining and gluing. It is to insure stability over this time that controlled conditions are exceedingly important.

Bonding Equipment

The advent of precision bonding equipment such as tapeless splicers, hot presses, and high frequency electronic bonders with their more exacting operating requirements call for more precisely manufactured wood parts. Such precision made parts, once well manufactured, retain the required dimensions only if held within the required moisture content limits throughout the manufacturing process.

Kiln Drying at the John Widdicomb Company

Knowing these factors that have been introduced and that dictate what moisture content conditions are most desirable, and in most cases mandatory, for good quality manufacture, let's review the equipment and actual practices set up by our concern to satisfy these conditions.

The kiln equipment at the John Widdicomb Company consists of four end piled internal fan kilns, supplemented by four natural draft vapor kilns. Box piled bunks are built at the siding, and are handed both manually and by power transfer. Bunks are stagger loaded in the kilns to utilize air circulation to the best advantage within practical limits. Hinged overhead baffles extend from the ceiling to the edge of the bunks to inhibit excessive short circuiting of air over the loads. With a 2" plenum and a 24" walkway between bunks we are not convinced we have the best possible circulation uniformity. However, moisture uniformity checks and velometer readings have failed to show gross inequalities.

The heater coils are headed and drained at the center of the kiln, two banks on either side. Each bank consists of 15 one-inch return bend lines extending from the center to either end of the kiln. Header and feeder lines are insulated and dry bulbs are located one-fourth of the way from the loading end of the kiln, all with the purpose of obtaining uniform temperature conditions and accurate control. Kiln controls are actuated by compressed air and have liquid filled control bulbs. This physical setup is typical. Our drying is tuned to production demands, but quality in drying is an equally important consideration.

To meet production demands our lumber is scheduled into the kilns as carefully as possible and our drying schedules are flexibly applied, based upon the material going into the kiln, its moisture content and critical conditions applicable.

Our schedules are seldom static for we are constantly experimenting with temperature and wet-bulb depression in an effort to get the work done most quickly without undue degrade.

This flexible approach isn't haphazard and requires a tremendous amount of close checking of stock in the drying operation and in the subsequent manufacturing process.

We have spent about six months using the new Forest Products Laboratory schedules, observing results and comparing them with past performances. Our findings seem to support our initial impressions, namely that initial drying progress is slower when the Laboratory schedules are used due to restricted dry bulb temperatures and wet bulb depressions. Intermediate and final drying, however, is good.

These facts have been our cue for schedule modification. Table 1 shows our operator's schedule for ⅞-inch red oak (**Quercus borealis**), a blend of several recognized commercial schedules, plus his own ideas, in comparison with the new Forest Products Laboratory Schedule for 4/4, 5/4, and 6/4 red oak. The difference in drying rate at the various moisture content stages as related to wet- and dry- bulb temperatures and total drying times is pronounced. Part of this difference is due to the necessity for a slower drying schedule suitable for 6/4 stock. Follow-up checks on degrade, waste and ease of manufacture showed no apparent differences between the schedules.

In analyzing and comparing these schedules and others, we feel that we are doing nothing more than the Forest Products Laboratory staff would recommend, in that it publishes its schedules as guides and encourages modification to fit individual operations and thickness variations.

Many like to compare kiln performance. For this reason Table 2 is included giving our average drying times

for given species, thicknesses and initial moisture contents. This table was compiled from data collected on charges run during the period July 1949 to January 1951.

Additional information found in Table 3 gives the average drying times for all runs of given species and thickness for the period January 1951 to March 1952. Although Tables 2 and 3 are not directly comparable, it is clear that our recent drying has been accelerated. This can be attributed to kiln changes and schedule modification.

Conditioning lumber to as near a stress-free condition as practical is an important operation for us, particularly for heavy stock. Experience has shown us that conditioning periods of the following duration are required:

DURATION OF CONDITIONING TREATMENT[1]

Cherry, maple, beech, birch

Stock size	Time—hours
4/4	10 to 15
5/4	15 to 20
6/4	20 to 25
8/4	40 to 45
10/4	45 to 50
12/4	50 to 60

Yellow poplar & basswood, etc.

Stock size	Time—hours
4/4	5
5/4	9
6/4	15
8/4	24

[1]Conditioning treatments are from time controls that were set until shut-off. The average time required to change temperatures from 180° F. dry bulb and 130° F. wet bulb to 180° F. dry bulb and 165° F. wet bulb was approximately 1½ hours.

Our drying standards used in conditioning and which also govern the drying periods given in the other tables, are specified at 6 to 8 percent final moisture content.

Post-kiln treatment of lumber is typical. Lumber is allowed to cool for at least one day before processing. Controversy existed within our plant, as well as in others, on the virtues of a storage conditioning period of at least a week or better before manufacture. My personal opinion is that our schedules plus our thorough conditioning treatment at high temperatures minimize our moisture gradient within the lumber. Essential moisture content differences existing at the time of kiln discharge are quite well equalized during the cooling process, a process that is believed to be more beneficial than generally recognized. Hot lumber exposed to vapor pressure differences that exist at room temperatures attains some degree of moisture content equalization.

Plant Humidification Control

Lumber dried and conditioned to a moisture content of from 6 to 8 percent requires maintenance of the same equilibrium moisture content conditions in the plant to prevent serious stock checking and shrinkage.

Summer problems are not too serious and can be controlled by the use of uncomfortably high temperature or dehumidifying equipment. However, winter poses a real problem of excessively low equilibrium moisture content conditions, a problem which can be treated, at least in part, by plant humidification.

Proper humidification is desirable in all departments of a furniture plant, but is particularly important in the rough mill, finish-machine room and cabinet room where the material is machined, glued and assembled. This has been the objective at our plant. Although we haven't been 100 percent successful in obtaining perfect moisture control, we have made great strides forward.

Combined in one large one story building, we have kilns, dry lumber storage, veneer storage, veneer processing and the rough mill. By virtue of its unity of location, materials in storage and in process are exposed to very much the same conditions. Under this arrangement conditions are held to

TABLE 1.—A COMPARISON OF DRYING RATES USING TWO SCHEDULES[1]

Current J. W. Co. Schedule—7/8-inch red oak

Moisture Content Percent	Dry bulb (Degrees F.)	Wet bulb (Degrees F.)	Relative humidity Percent	Time at set Hours
68.9 to 45	116	110	82	98
45 to 35	116	108	76	39
35 to 30	120	110	72	24
30 to 25	126	110	61	26
25 to 20	132	111	50	22
20 to 15	145	118	44	32
15 to 13	157	122	35	15
13 to 6.8	180	130	26	29
				Total 285 or 11.9 days

Total moisture content reduction 62.1 percent; average per day 5.2 percent.

Forest Products Laboratory Schedule (T4-D2)

67.6 to 50	110	106	87	123
50 to 40	110	105	84	113
40 to 35	110	102	75	31
35 to 30	110	96	60	25
30 to 25	120	90	31	41
25 to 20	130	50	10	25
20 to 15	140	90	14	27
15 to 7.8	180	130	26	49
				Total 434 or 18.1 days

Total moisture content reduction 59.8 percent; average per day 3.3 percent.

[1]Comparison of actual 7/8-inch red oak (**Quercus borealis**) kiln charges using the schedule from Forest Products Laboratory Report D1791 for 4/4, 5/4 and 6/4 stock and a modification at the John Widdicomb Company. Moisture control was by use of control samples.

amazingly close and acceptable moisture limits by the presence of the kilns and their unavoidable leakage.

This has been our answer to the ever difficult problem of humidifying a large area with a very rapid air turnover due to multiple waste exhausts. During the shut-down hours the ceiling space heaters are set for 60° F. and this helps provide for the desired conditions for the rough dry lumber and for material in process.

To check these conditions, stations throughout this area have been designated at which periodic temperature and humidity conditions are taken and recorded. The indicated range has been found to be between 6.3 to 8.6 percent equilibrium moisture content.

To prevent spot drying, all unit heaters have their louvers adjusted horizontally. Each unit is located opposite cold draft and each is part of an air circulation pattern.

Periodic spot checks are made on veneer and lumber in process and in storage. These have indicated, with some rare exceptions, that the material is within the desired range in moisture content. Some veneers have shown

TABLE 2—AVERAGE NUMBER OF DAYS DRYING TIME
From July 1949 to January 1951[1]

Thickness	percent Under 30	percent 30 to 40	percent 40 to 60	percent Over 60
		CHERRY		
4/4	6	11	13	15
5/4	6	12	18	21
6/4	7	15	24	30
8/4	15	26	30	39
10/4	—	35	38	—
12/4	29	49	50	56
		MAHOGANY		
4/4	6	—	—	—
5/4	—	—	—	—
6/4	10	—	23	—
8/4	10	15	29	—
10/4	10	—	—	—
12/4	—	—	35	—
		POPLAR		
4/4	4	7	—	—
5/4	3	6	8	10
6/4	10	—	—	—
8/4	12	—	—	—
		SOFT MAPLE		
4/4	5	—	—	—
5/4	9	—	18	—
6/4	10	16	—	—
8/4	—	—	—	—
10/4	26	—	—	—
		OAK		
3/4	4	10	15	22

[1]Dried in end piled, 4-bunk, converted standard kilns at John Widdicomb Company.

TABLE 3—AVERAGE DRYING TIMES IN DAYS
From January 1951 to March 1952

No. of Runs	Thickness	Av. initial moisture content Percent	Days drying time
	CHERRY		
3	12/4	44	43.3
4	10/4	40	32.0
16	8/4	46	23.4
5	6/4	38	12.3
5	5/4	40	10.5
9	4/4	25	5.9
	HONDURAS MAHOGANY		
1	10/4	34	30.5
2	8/4	39	20.9
2	6/4	37	15.5
1	5/4	21	3.3
1	4/4	17	3.2
	YELLOW POPLAR		
1	8/4	61	17.6
7	5/4	53	6.6
8	4/4	19	2.5
	RED OAK		
14	3/4	50	12.3
	SOFT MAPLE		
1	10/4	29	19.9
2	8/4	39	18.3
4	6/4	34	7.8
2	5/4	16	3.5
2	4/4	17	2.9

moisture contents slightly higher than the specified range, a condition which is more beneficial than detrimental.

Humidification for our finish mill, sanding department, and cabinet room is handled in a more orthodox manner by the use of fan-backed, filament controlled cold water atomizers.

Although the humidification is automatically controlled, we have arranged our units so that the fans work full time. This, we believe, provides for the air circulation so important to temperature uniformity. Controlled humidity in the finishing department is desirable, but we, as yet, have not felt the urgent necessity for installing the equipment. This, however, does not include the finish drying ovens in which air is heated from 100° to 130° F. and some humidification is necessary. This we accomplish by the use of a cold water atomizer just ahead of the blower fan in the duct system. Admittedly this system doesn't bring oven conditions up to the 6 to 8 percent moisture content

range, but it does do the job, for drying checks are not found and moreover condensation problems are not encountered.

Finished goods are stored at room conditions on the first floor, and although not exposed to controlled conditions, they are not subjected to exceptionally dry conditions.

This paper presents a brief review of the moisture problem that we and most of you wood furniture manufacturers face. We have approached these problems objectively but we recognize the limitations in our process and the variety of wood manufacturing conditions encountered. No single formula or group of formulae seems to apply to all plants. Therefore, we cannot offer as a recommendation our drying schedules or humidification procedures, but we do recommend an open-minded, progressive, technical approach to both problems.

This speech was first presented at the 1952 F.P.R.S. meeting and is reprinted here with permission.

WEST COAST PLYWOOD MEN ELECT

West coast plywood manufacturers laid plans at their annual meeting recently for a series of summer and fall smash campaigns that will triple the scope of fir plywood promotion in the second half of 1953.

In a meeting in Gearhart, Ore., attended by some 250 plywood leaders from Washington, Oregon and California, the panel makers outlined a series of promotion moves intended to absorb the expanding production facilities of the 87-factory industry which is now selling plywood at the rate of over 3 billion square feet annually. At the same time, they elected E. Eberly Thompson, vice-president and director of M and M Wood Working Co. of Portland, Ore., president of Douglas Fir Plywood Association.

Thompson succeeds B. V. Hancock, outgoing president of the industry trade association, who delivered the keynote address of the meeting. Hancock, executive vice-president of Cascades Plywood Corporation, announced that despite an average weekly production of 70 million square feet, the industry's total backlog of unfilled orders is still close to six weeks. However, he pointed to the industry's expanded capacity and said that since the beginning of 1952, the number of plants has increased from 76 to 87.

Elected with Thompson as new officers of the association were: vice-president, H. B. Garrison, vice-president, Evans Products Co., Coos Bay. Ore.; secretary, R. A. Neumann, president, Elliott Bay Mill Company, Seattle, Wash.; and treasurer, Arthur Berggren, general manager, Puget Sound Plywood, Inc., Tacoma, Wash.

WIN TRIP TO BERMUDA

The Acme Steel Company, 2840 Archer Ave., Chicago, Ill., is sponsoring a contest for employees and officials of any firm, industry or organization other than manufacturers of flat steel strapping, their subsidiaries and their advertising agencies. The contest is to bring to light new ways in which flat steel strapping can be used to help all industry do a better job of packing, shipping and handling materials.

First grand prize will be a trip to Bermuda for two or $1000. Second prize will be $500 and third prize, $250. Fifteen additional prizes of $100 each will be awarded.

Each entry will be judged solely on the basis of its value to the user and its possible value to others in the shipping and handling of materials. Any brand of steel strapping may be used in these examples. Complete information is available from the company.

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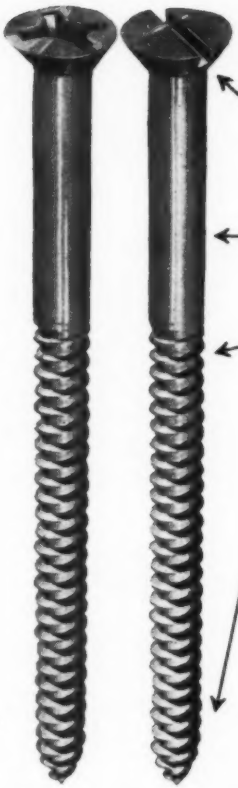

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New Literature

PROTECTION FOR FURNITURE

The Kimberly-Clark Corporation of Neenah, Wisconsin, is offering both samples and folders to acquaint furniture manufacturers and others with its new general purpose interior packaging material. This will be known as "Standard" Kimpak - Type 301.

The material is clean, soft, non-staining, completely free of abrasive materials and provides good packaging protection. Kimpak - Type 301 is natural tan and may be ordered plain or embossed, in rolls or sheets from 2" to 60" wide. The new material meets all railroad and government packaging specifications.

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reader just what the subtitle challenges him to take—"A tour of Southern Screw Company." The booklet is published by the Southern Screw Co., Statesville, N.C.

The location of this company eight years ago in the center of the southern furniture industry, also a strategic position for prompt service wherever wood screws are needed, is explained by Fritz Jensen, president of the company. Plant superintendent Eric Green conducts the tour through every step for efficiency and economy in mass production of wood screws.

FURNITURE FINISHING

A new 12-page booklet called "The 3M System of Furniture Finishing" has been announced by Minnesota Mining and Manufacturing Co., 900 Fauquir St., St. Paul, Minn.

The illustrated "how-to-do-it" booklet deals with industrial furniture finishing and describes procedures for

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such operations as core stock finishing and veneer fabrication, drum and belt sanding, intermediate sanding, sealer sanding, and final finish rubbing to obtain a variety of finishes.

It also discusses finishes for various coatings and lists common finishing faults.

The booklet includes a table listing "3M" brand abrasives for the woodworking industry and the complete line of furniture finishing compounds and polishes.

BEVEL BAND SAW

There are two new bulletins—B-17 and B-11—available from L. Power & Co., 2815 Oakford St., Philadelphia, Pa. These bulletins describe two bevel band saw machines. B-17 is a hand operated tilting band saw while the B-11 is fully automatic in its tilting and can be angled either side of vertical to 45 degrees.

Varying speed arrangements are available up to a 10-1 range to give

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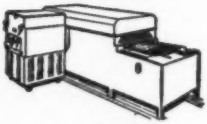

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approximate surface cutting speeds of 170 to 1,700 f.p.m. Another new feature of design now made available for aircraft industry requirements, is an adjustable table with a 4" maximum vertical travel below the centerline of the angling motion. This makes it possible for the operator to adjust the height of the table to the thickness of the stock so that the top level of the block being cut will always be on the centerline of tilt, and the cutting blade will pierce the material on this centerline.

These brochures illustrate the machines, give specifications and all working details.

A STORY OF PLYWOOD

The plywood story from tree to finished product is told in a new 20-page booklet recently issued by the Associated Plywood Mills, Inc., Eugene, Oregon. Entitled "The Story of A.P.M.I. Plywood," the booklet uses 39 action pictures to show and describe

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IRVINGTON SAWS

Irvington Machine Works, with plants at 1808 N.E. 7th Ave., Portland 12, Oregon, and 3 Colfax N.E., Grand Rapids 5, Mich., has just released a new eight-page folder on the Irvington No. 19 automatic and semi-automatic cutoff saw. This production line machine, adaptable for individual or automatic cutting, is well known in cut-up plants, furniture plants, box factories and remanufacturing plants.

The well illustrated folder graphically demonstrates the many operator advantages and safety features along with the adaptability of the unit to cut all types of stock. Cut-away photos of the power and operating units, installation layouts and specifications complete the story.

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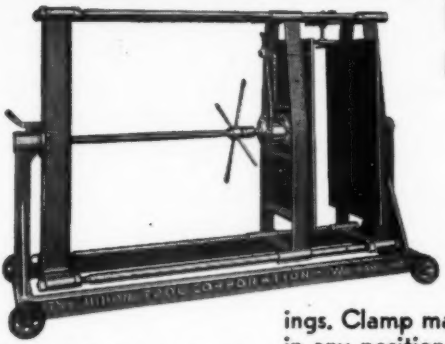
3 Colfax N.E., Grand Rapids 5, Mich.

WESTERN PINE LISTS 82 PUBLICATIONS

A complete new listing of all publications put out by the Western Pine Association has been assembled and released, the association announced today.

Covering everything from hobbyists' woodcarving to technicians' research, most of the publications listed are available free of charge for single copies. They include descriptive folders, booklets, teaching aids, how-to-do-it sheets, lumber grade-use guide pamphlets, species books, dealers and consumer publications, grading rules, standard pattern, technical bulletins and laboratory notes.

a UNION machine . . .
TO MEET ANY WOOD GLUING NEED •



UNION *Air-Operated
REVOLVING CASE CLAMP

With Self-Aligning Ball Bearings

Fast, dependable, accurate. Back platen is fixed. Operating platen equipped with oilite bronze bearings. Each platen measures 48" x 27". Distance between upper and lower rods, 60". Clamping frame cradled in self-aligning ball bearings. Clamp may be revolved to any angle or locked in any position.

*May be equipped for hand operation if desired.

Name of Union agent in your territory supplied on request.

•

Write for your free copy, "The How's and Why's of Wood Gluing," by Thomas D. Perry.

•

Union makes equipment for every standard production job in wood gluing. Also designs and makes machines for special applications—including machines for electronic gluing. Write for data on the complete Union line.

UNION SERVES OVER 2,000 SATISFIED CUSTOMERS

UNION TOOL CORP.

300 EAST MARKET ST., WARSAW, INDIANA, U. S. A.

USERS SAY UNION CUTS COSTS — SPEEDS PRODUCTION

The list may be obtained free of charge by writing for P.L. No. 27, Western Pine Association, Yeon Building, Portland 4, Oregon.

PALMGREN PRODUCTS

The Chicago Tool and Engineering Co., 8383 S. Chicago Ave., Chicago, Ill., is offering a new eight page catalog on Palmgren products. The complete line includes production vises, angle vises, drill press vises, swivel machine vises, rotary tables, hand vises and other accessories. The catalog is well illustrated.

"GLUE LINE" AVAILABLE

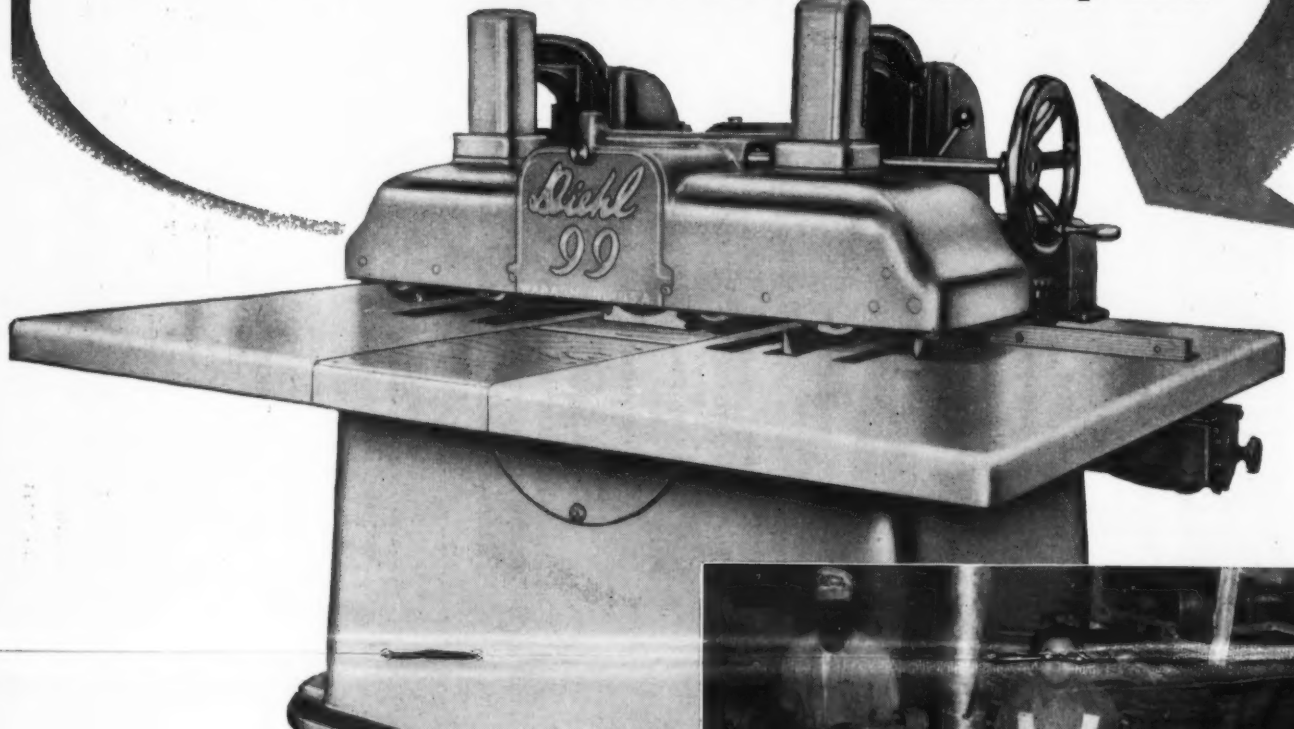
The "Perkins Glue Line," informative house organ devoted to glues and gluing, is again being published periodically by Perkins Glue Company, Lansdale, Pennsylvania.

Current issue of the publication, dated June, 1953, may be obtained by writing to Perkins Glue Company. Those who request the current issue will automatically receive future issues. There is no charge or obligation involved.

Feature article in the June issue is a report on the special glue formulae available to meet the special requirements of high frequency gluing ap-

Multi-Ripping for Profits!

New DIEHL #99 Multi-Rip Saw



Want Production? Built for high-volume output, new Diehl #99 Multi-Rip offers *eight* feed speeds in *two* ranges, up to 180 fpm or *faster* if desired. Stock thickness up to 3¼". New attachment permits *fast, accurate* throatplate cutting. Saw gangs changed quickly by removing 3 nuts on special sleeve mounting.

Want Precision? Entirely new unitized design of arbor mounting, table and frame features simple, *rigid* construction—makes Diehl #99 vibration-free for *greater accuracy* with *minimum* adjustment and maintenance.

Want Safety? New Diehl #99 offers Double Kick-Back Guards—one set in upper pressure bar adjustable to stock thickneess; other set in table top to catch all slivers. Exhaust system is *built-in* for cleaner operation. Gear cases are *fully enclosed.*

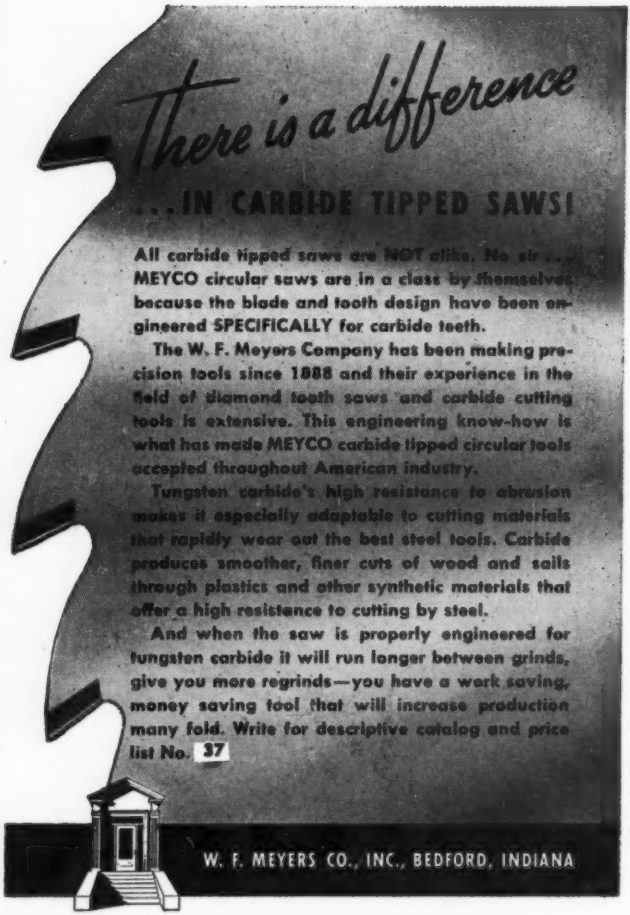
New Diehl #99 Multi-Rip Saw in action at Memphis Furniture Manufacturing Company, Memphis, Tenn. Operators like its easy set-up features and simplicity of adjustment; management depends on the new #99's high-volume performance for maximum production.

• For specific information on all-new, all-performance Diehl #99 Multi-Rip Saw, see your Diehl Representative—or write The G. M. Diehl Machine Works, Inc., Wabash, Indiana, for new Bulletin MRS-1052.

On the Banks of the Wabash

THE G. M. **Diehl** MACHINE WORKS, INC.

WABASH, INDIANA • U.S.A.


There is a difference
...IN CARBIDE TIPPED SAWS!
All carbide tipped saws are NOT alike. No sir ... MEYCO circular saws are in a class by themselves because the blade and tooth design have been engineered SPECIFICALLY for carbide teeth.
The W. F. Meyers Company has been making precision tools since 1888 and their experience in the field of diamond tooth saws and carbide cutting tools is extensive. This engineering know-how is what has made MEYCO carbide tipped circular tools accepted throughout American industry.
Tungsten carbide's high resistance to abrasion makes it especially adaptable to cutting materials that rapidly wear out the best steel tools. Carbide produces smoother, finer cuts of wood and sails through plastics and other synthetic materials that offer a high resistance to cutting by steel.
And when the saw is properly engineered for tungsten carbide it will run longer between grinds, give you more regrinds—you have a work saving, money saving tool that will increase production many fold. Write for descriptive catalog and price list No. 37
W. F. MEYERS CO., INC., BEDFORD, INDIANA

plications. Other articles of equal interest to glue users are also included in the 4-page publication.

STEEL STRAPPING AT WORK

The current issue of "Confab," Acme Steel Company's 12-page quarterly publication devoted to the latest cost saving applications of steel strapping and wire stitching, is just off the press. The magazine is published by the Acme Steel Co., 2814 Archer Ave., Chicago, Ill.

In this issue are six feature articles, three short photo-caption stories, an announcement of Acme Steel's contest, and an editorial by Carl J. Sharp, president, on the topic, "Rebirth Of Freedom Of Opportunity."

MATERIAL HANDLING

The vital subject of material handling is the theme of the third issue of "Industry Ideas," a new publication developed in the interest of Business and Industry Improvement by the Cleve-

glue it in *SECONDS* with the REEVELEC "500" WOODBONDER

A complete line of electrodes for special operations are carried in stock.

Here is a proven production tool for every woodworking organization. If you use glue—you can use the REEVELEC "500." This electronic woodbonder permanently sets glue in a few seconds and saves you time, space and manpower. In addition, you get a more uniform, better quality product.

WRITE NOW FOR COMPLETE INFORMATION ON THIS OUTSTANDING WOODWORKING EQUIPMENT

If your operations include . . .

- Laminating
- Edgebanding
- Panelling
- Patching
- Corner gluing
- Inlaying

You need a REEVELEC WOODBONDER

REEVE ELECTRONICS INC.

617 W. LAKE ST.
CHICAGO 6, ILL.

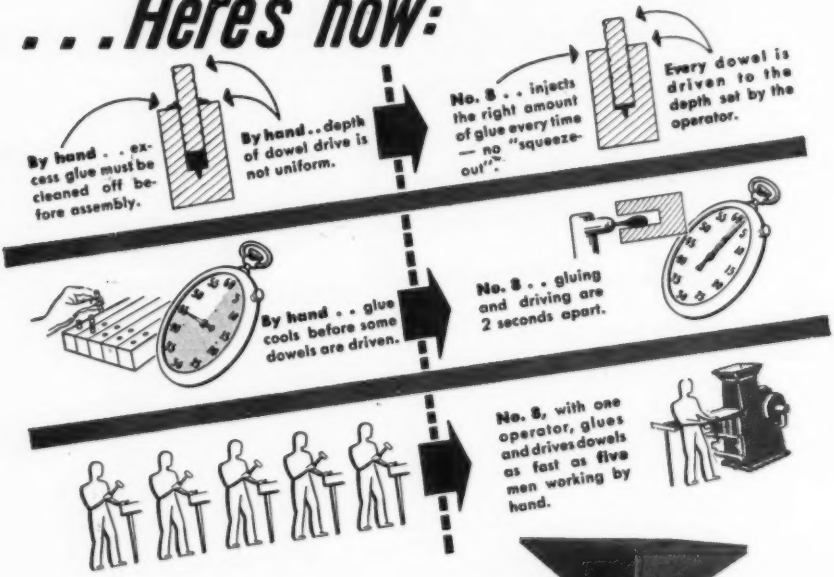
land consulting engineering form of Wheeler Associates, Inc., 15017 Detroit Ave., Cleveland, Ohio.

The new issue contains four valuable cost-cutting ideas on material handling. Also included is a material handling check list designed to aid plant personnel to evaluate their own handling system. Under such section headings as labor, materials, equipment and costs are such fact-finding questions as "Do skilled operators or assemblers waste time handling materials?", "Where is material placed in relation to operator and operation?", "Do you have production delays due to poor delivery and removal?", and many others. In all, 30 questions are posed in the check list.

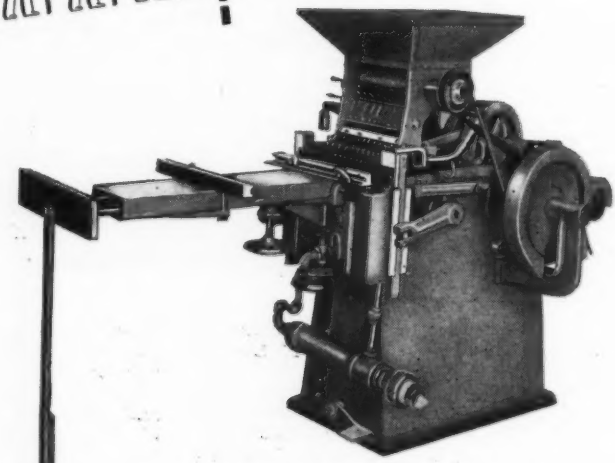
"Help Yourself" is a recent department in WOOD WORKING DIGEST. Refer to it for literature on woodworking equipment.

Better dowel joints actually cost less

. . . Here's how:

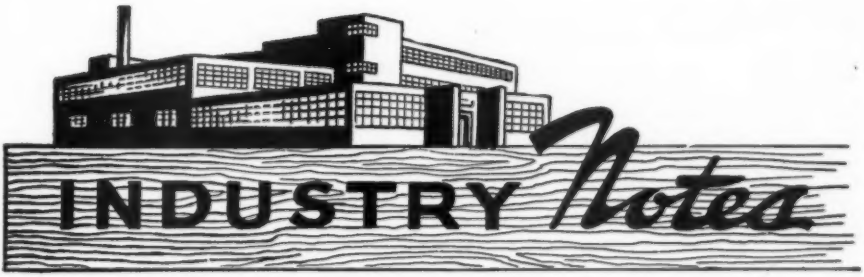

By hand . . excess glue must be cleaned off before assembly.
By hand . . depth of dowel drive is not uniform.
No. 8 . . injects the right amount of glue every time — no "squeeze-out".
Every dowel is driven to the depth set by the operator.
By hand . . glue cools before some dowels are driven.
No. 8 . . gluing and driving are 2 seconds apart.
No. 8, with one operator, glues and drives dowels as fast as five men working by hand.

You get 5 times faster dowel gluing and driving . . . you save on "clean-up" before assembly . . . joints are stronger because dowels are driven while glue is **hot.** Result Rock-bottom dowel driving costs — plus better finished products. Ask for full information on the Bell No. 8 Gluer and Dowel Driver.



The Bell Machine Company
71 Jackson Drive
Oshkosh, Wisconsin

BELL WOODWORKING MACHINERY



PEERLESS BUYS FOREST CITY PRODUCTS

Th Peerless Wood Products Co., of Rockford, Ill., announces that it has recently taken over the machinery and equipment of the Forest City Wood Products of Rockford, Ill., and is in production. We are told that Peerless will continue to offer the dowels made by Forest City as well as its own line of wood plugs, buttons, table pins and wood furniture knobs.

NEW HOME FOR FJELLMAN & WINTHER

The Fjellman & Winther Engineering Company announces that it is now in its permanent home on Republic Ave. near Jefferson St., Joliet, Ill. Mail address is P.O. Box 1205. The firm plans to have a hot plate press in operation so that visitors to the office can see it in work. Fjellman & Winther manufactures a complete line of hot plate presses.

SPOTNAILS MOVES

Spotnails, Inc., has moved into its new plant at 1527 Lyons St., Evanston, Ill. The new plant was built to better accommodate the firm's manufacturing operations. At present bulk wire flows in through an intake dock and is processed directly through the plant to a conveyor system for outgoing shipment.

The firm's old plant, 1218 Sherman Ave., Evanston, is now for sale. It has 6,000 sq. ft. of factory space, oil heat and shelving. This two story structure is available immediately.

PATRONSKY JOINS WABASH SCREEN DOOR

L. A. Patronsky joins the Wabash Screen Door Company, of Chicago, as assistant vice president and director of research. In addition to teaching 14 years at the University of Michigan School of Natural Resources, he has directed numerous research projects on wood machining, gluing and wood waste utilizations which were sponsored by the government and private industry. Last December "Pat" was elected to the executive committee of the Wood Industries Division of the American Society of Mechanical Engineers.

Patronsky will devote the major portion of his time to the production of "Chipcore" at the Minneapolis factory of the Wabash Screen Door Company.

SPRAY FINISHING CLASSES

The schedule for the latter half of 1953 is announced by the DeVilbiss Company, Toledo 1, Ohio, for courses of instruction in industrial spray finishing methods in its school of spray painting, now in its 27th year of tuition-free operation for users of DeVilbiss equipment. Applications should be made as early as possible for enrolling foremen, shop superintendents, maintenance supervisors, spray operators and any others who wish to attend the week-long classes as follows: July 13, August 17, September 14, October 12, November 9 and December 7. These classes will be held in the modern school headquarters now in operation adjoining the main plant at Toledo.

Overload capacity cuts down floor space and labor

Write for Further Information

Sturdy, heavily built but well balanced and easy to roll. Capacity 3000 lbs. Steel reinforced construction. Plain, roller bearing and rubber tired wheels. Sizes to your specifications.

LINEBERRY FOUNDRY & MACHINE CO.

317 Forester Ave. North Wilkesboro, N. C.

AMERICAN HARDWARE CORP. DIVISION MOVES

Manufacturing operations in the new Corbin Wood Products Division of the American Hardware Corp. in Hornell, N.Y., started May 18. Plant manager is James L. O'Toole.

Approximately 100 workers are employed at this Wood Products Division which specializes in the fabrication of sorting tables and racks, lock boxes, cabinets and other items of mail handling equipment. Founded in 1888, the Wood Products Division has been located at the main plant in New Britain, Conn.

NEW CHIEF ENGINEER FOR GREENLEE

After 47 years of service, Judson H. Mansfield has retired from Greenlee Bros. & Co., Rockford, Illinois. He is succeeded by Joel A. Jannenga, who has been with the Company since 1949, after serving several years with Remington-Rand and the Ingersoll Milling Machine Co.

Mansfield joined Greenlee as an apprentice patternmaker in 1905, was moved to the Engineering Department in 1907, and became chief engineer of all divisions in 1918, He has long been a member of the American Society of Mechanical Engineers and was made a Fellow of the Society in 1951. He is being retained as an engineering consultant by Greenlee.

CLARK EQUIPMENT COMPANY ANNOUNCES PURCHASE OF ROSS CARRIER

Clark Equipment Company, Buchanan, Mich., a leading manufacturer of materials-handling industrial trucks and heavy automotive transmissions, has formally acquired all the capital stock of the Ross Carrier Company of Benton Harbor, Mich., George Spatta, Clark president, announced over the weekend. Michigan Power Shovel Company, a subsidiary of Ross Carrier Company, is included in the transfer.

Appointments

John F. Wagner is new vice-president of the Davis Plywood Corporation of Cleveland, Ohio. He has been with the firm since 1936.

Firth Sterling Inc., Pittsburgh, Pa., has made a number of changes in its staff. **R. O. Valoon,** with the firm for 19 years, has been appointed district

R. O. Valoon

John Wagner

manager of the new Chicago district. **Lester N. Shannon, Jr.,** replaces C. E. Hughes, who resigned, as district manager of the southern district. New assistant manager of carbide sales is **James E. Gray.** The firm has appointed a new manager for the Ohio district. He is **Stuart A. Smith.**

J. E. Gray

L. N. Shannon

Lieutenant General Lewis A. Pick, U.S.A. (Ret.) has been elected vice-chairman of the Georgia-Pacific Plywood Company. Recently General Pick has made a 45 day tour of the firm's 15 manufacturing plants and 28 warehouses. His headquarters will be at the general office in Olympia, Wash.

Plywood Furniture Corp., Portchester, N. Y., has named **Carryl L. Weil** as vice-president and sales director.

The Bellow Co., Akron, Ohio, has appointed two field engineers to service

EFFICIENT DUST COLLECTING CAN MEAN INCREASED PROFITS

Large cyclone collector is part of Dixie installation at Ox Fiber Brush Co., at Frederick, Maryland

Efficient dust control means greater output for less cost in any plant where industrial dust is a problem. Thousands of woodworking plants big and small are today benefiting from tailor-made dust removal systems designed and installed by Dixie. If you have a dust problem, consult a Dixie engineer for expert direction . . . There's no obligation.

GET THIS FREE BOOK . .

Dixie Booklet 47b "DUST COLLECTORS" contains valuable data and charts to guide you in determining the requirements for adequate dust removal in your plant. Write for it today. . . . It's FREE.

DIXIE

MANUFACTURING CO., INC.

1311 RUSSELL ST. BALTIMORE 30, MD.

S. A. Smith

Gen. L. A. Pick

territories with the following headquarters: **W. W. Smith** in the Cleveland office; and **David J. Trepanier** in the Akron office.

The Bradley Paint Co., 4070 E. Washington Blvd., Los Angeles 23, Calif., has appointed **E. R. Hollinger** as director of its furniture finishes division.

Schuyler A. Palmer, 385 E. Green St., Pasadena, Calif., is now serving as sales agent for the Arizona and southern California territory of the William Patent Crusher & Pulverizer Company of St. Louis. **Woodrow W. West,** 1472 Broadway, New York City, has been appointed sales representative for eastern New York, Connecticut and northern New Jersey.

Formation of a new staff department position in the wood preserving division

W. W. West

S. A. Palmer

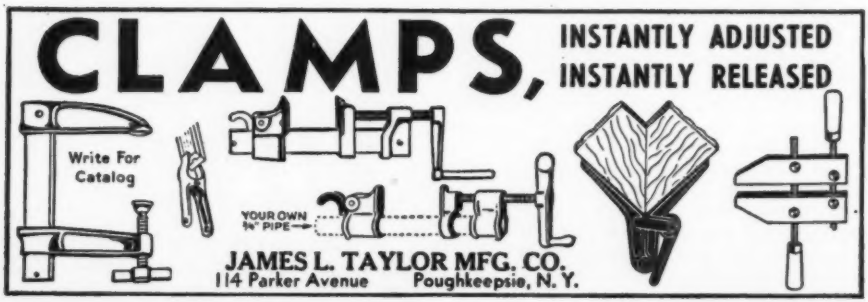
of Koppers Company, Inc., and subsequent appointments and changes within the division have been announced recently. **R. M. Killey,** who has been eastern district manager, has now been appointed manager of timber operations. **J. E. Younkin** succeeds Mr. Killey as eastern district manager. **D. A. Mitchell,** superintendent of plants for the division, has been named Pittsburgh district manager. **E. R. Snodgrass,** chief engineer of the division, succeeds Mr. Mitchell. **J. H. Lay** has been appointed assistant to the industrial relations manager in the wood preserving division. **R. A. Piepho** succeeds him as superintendent of the Orrville, Ohio, plant.

E. G. Warrick, chief engineer of Delta Manufacturing Div., Rockwell Manufacturing Co., has been promoted to chief engineer of the firm's power tool engineering division.

Fred M. Gillies

Carl J. Sharp

Acme Steel Company, Chicago, Ill., announces a change in its officers, **Chester M. MacChesney,** formerly chairman of the board, was elected chairman of the executive committee. This is a newly created position. **Carl J. Sharp,** formerly president, was elected chairman of the board. **Fred M. Gillies,**



Paul S. Smith

E. W. Forth

previously executive vice-president, was elected president. **Guy T. Avery**, formerly vice-president of production, was elected executive vice-president. **Bartlett Richards**, formerly assistant to the vice-president of production, was elected vice-president of production. **Thornton A. Rand**, previously secretary and treasurer, was elected vice-president and treasurer. **Donald P. Mullaney**, formerly legal counsel for the company, was elected secretary.

The appointment of **Paul S. Smith** as manager of its newly organized lumber division has been announced by Aetna Plywood & Veneer Co., Chicago. Aetna's new division will specialize in handling direct mill shipments of lumber cars and of mixed cars of lumber and plywood.

DeWalt Inc., Lancaster, Pa., has named **Edward W. Forth** as assistant plant superintendent of the firm. **E. B. Gates** has been assigned the position of assistant to William Dudley, DeWalt district manager for the southern California territory.

R. P. A. JOHNSON CITED BY AGRICULTURAL SECRETARY

R. P. A. Johnson, chief of the division of Timber Mechanics at the Forest Products Laboratory, was cited recently for superior public service by Secretary of Agriculture Ezra Taft Benson. The ceremony was held in Washington, D.C.

Johnson has long been recognized a leader in the field of proper and effective utilization of wood. He is an aggressive and optimistic fighter on behalf of wood and recognized as an authority in his field.

RUDOLF BASS

HIGH QUALITY - LOW IN PRICE

SIMONDS

New SI-CLONE SAWS

SCIENTIFICALLY HEAT TREATED • ACCURATELY GROUND
CUTS STRAIGHT • FAST • SMOOTH — STAYS SHARP

This complete new line of circular saws UP TO 12" in diameter, will give long, satisfactory service, excellent performance and the most value for the least cost. For use on all makes of table, bench, swing, radial arm and portable electric hand saw machines.

TYPE OF SAW	SIZE	PRICE
Cut-off	6"	$1.75
Rip	7"	2.00
Combination	8"	2.15
52, 54, 60	10"	3.15
Easy Cut	12"	4.35

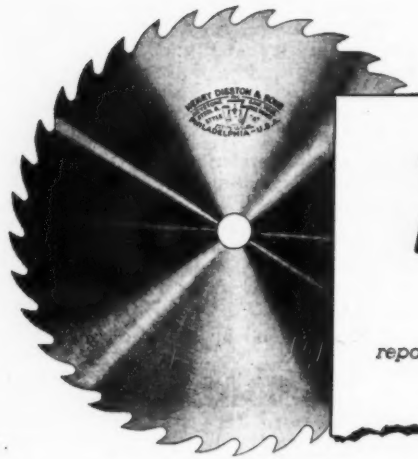
TYPE OF SAW	SIZE	PRICE
Hollow	6"	$2.75
Ground	8"	3.95
Planer	10"	7.45
	12"	9.95

ALL SAWS SHIPPED POSTPAID EXCEPT C.O.D. ORDERS. SPECIFY BORE WHEN ORDERING, OR IF PORTABLE ELECTRIC SPECIFY MAKE AND MODEL. SEND FOR LITERATURE.

Each saw is individually packaged, in factory-perfect condition, ready for use.

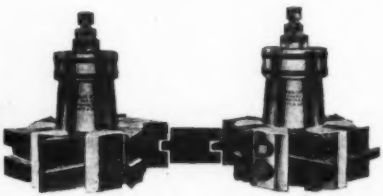
STOCK UP NOW • ORDER TODAY • WRITE FOR FREE CATALOG

RUDOLF BASS 173-177 Lafayette St. New York 13, N.Y.



"DISSTON saws and knives save us time and money"

reports foreman of Texas flooring company to local Disston Distributor



LANCASTER CORPORATION of Fort Worth, Texas, one of the Southwest's largest manufacturers of hardwood flooring, has an annual output of some 10,000,000 board feet of quality-cut lumber. To achieve the utmost efficiency, the company uses Disston saws and knives exclusively.

Mr. Shadrake, Plant Foreman, recently reported to the General Industrial Supply Corp., the Disston Distributor in Fort Worth, "Disston saws and knives are the best I have ever used. Their top quality and performance have saved us time and money. I would recommend them to anyone!"

We honestly believe *you* will be as enthusiastic in your praise as Mr. Shadrake, once you begin using Disston tools in your plant. Put Disston woodworking tools to work for you and you'll see production and quality go up, costs come down.

For prompt service • expert advice • reliability • many economies

SEE YOUR DISSTON DISTRIBUTOR

HENRY DISSTON & SONS, INC.

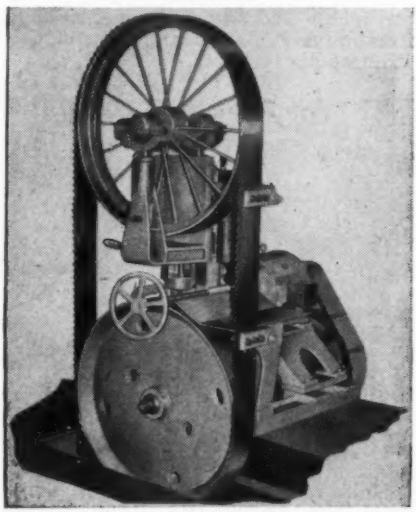
795 Tacony, Philadelphia 35, Pa., U.S.A.

Canadian Factory: 2-20 Fraser Avenue, Toronto 3, Ont.

EQUIPMENT and Supplies for the WOODWORKING INDUSTRY

MEDIUM DUTY BAND MILL

A new 54" medium duty band mill which it is claimed increases lumber yield has recently been introduced by McDonough Manufacturing Company of Eau Claire, Wisconsin.



In addition to the saving in kerf the new band mill is said to produce more lumber because it saws faster and that less horsepower is required to operate the saw than is needed for a circular saw of comparable size. In addition it is claimed that more accurate lumber is produced and a combination of less kerf, more production and better lumber effects a considerable saving over circular saw operation.

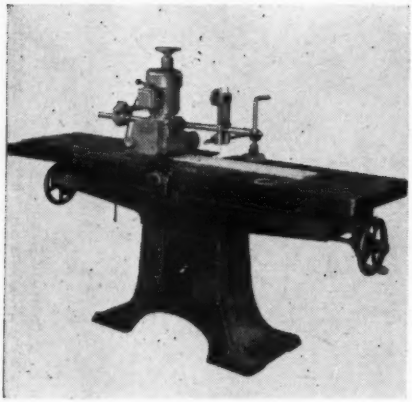
The manufacturer also has available detailed plans for converting the circular saw husk to drive the band mill, the carriage, an edger or all three.

The McDonough 54" medium duty band mill has heavy duty Timken bearings which hold maintenance to a minimum. It uses up to 9" saw blades. A top saw guide control mounted on the sawyer side is furnished as standard equipment. It can also be furnished on the off-bearer side at no extra cost. Other features include knife edge saw tension and a solid bottom fly wheel which maintains the saw speed. It is available for left or right hand operation and for belt or motor drive.

POWER FEED ATTACHMENT

This power feed attachment is for use on band saws, variety saws, shapers and for use as a facing attachment on jointers. The unit is offered by Woodworker's Tool Works, Inc., 220 S. Jefferson St., Chicago, Ill.

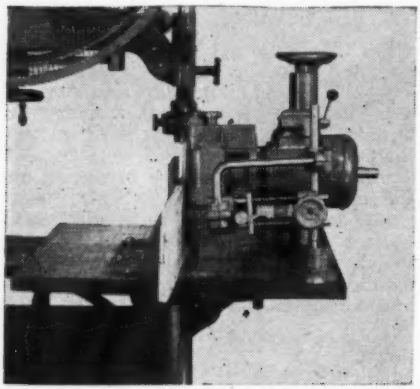
The feed attachment is motor driven with ½ h.p., 220 v., 3 phase 60 cycle motor. It has a variable feed from 10 to 90 f.p.m. The attachment produces



Used on a jointer.

accurate resawing. Stationary gauge is fastened to left of saw blade to desired position. Spring pressure on feed rollers allows for uneven thickness of lumber.

When the attachment is used on a jointer, stock is fed by hand until the



Power feed attachment used on a band saw.

corrugated rollers grip the stock. After that the stock is fed by power. Used on a shaper, stock can be fed from above or sideways.

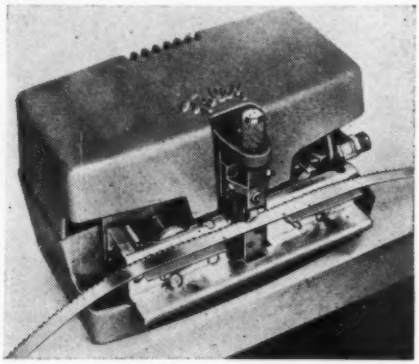
MEYCO CARBIDE SAW

A new controlled cut, carbide tipped safety saw has been placed on the market by the W. F. Meyers Co., Inc., Bedford, Indiana. We are told that this safety saw will not grab work, consequently will not kick-back at the operator. It cuts down on the cause of many accidents because it will not grab and pull in the hand that accidentally touches it.

The W. F. Meyers Company has been manufacturing tools since 1888. These include: diamond tooth saws, carbide inserted drill jig bushings; solid carbide and carbide tipped circular cutters and an entire line of carbide tipped circular saws.

BAND SAW SETTER

The Foley automatic power setter features a new "twin-hammer" action that will set both rows of teeth (both sides of saw) in one operation. Setting speed ranges from 6½ to 15 seconds per foot, for saws with 4 to 8 points per inch up to 1½" wide. (The machine also sets hand saws from 4 to 16 points per inch.) The saw setter is available from the A. P. Foley Manufacturing Co., Minneapolis 18, Minn.



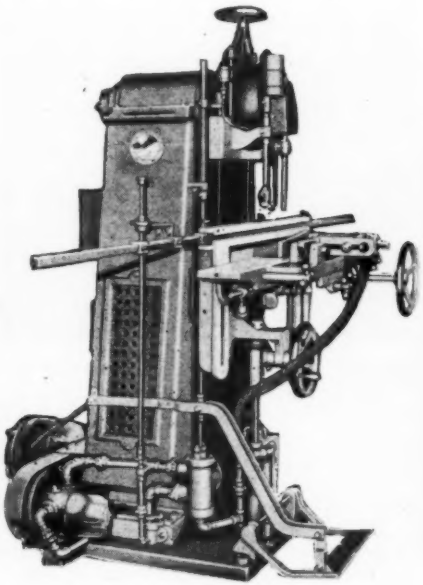
Uniformity of set for all teeth results from the exclusive Foley "twin-hammer" action, as both hammers are powered by one spring. This precision set avoids tooth breakage. The saw may be set either before or after filing.

Long life is assured by hardened steel anvils and hammers, precision bushings

and life-time lubricated ball bearings where needed. It is equipped with motor and "step-on" foot switch.

CHAIN-SAW MORTISER

A chain-saw mortiser is being offered to the trade by the Northfield Foundry & Machine Co., Dept. WD, Northfield, Minn. The entire cutting unit on this machine is built as a compact power unit. The 7½ h.p. motor is built directly on the spindle shaft. The machine can be arranged with an extended spindle to carry two sets of chain saws—order accordingly, however. The two sets of chain saws are an advantage in some classes of work. The standard single chain saw machine is recommended for all general work.



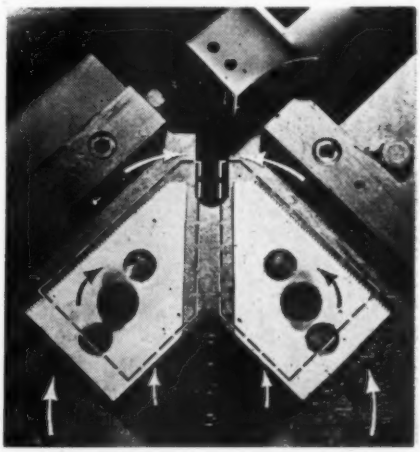
The table has an adjustable back rest and is equipped with a facing adjustment which allows the table to be adjusted in and out from the face of the column to the center of a 5" piece of material. The table is adjusted vertically for the different sizes of work by means of a hand wheel and bevel gears. We are told that there is no twisted motion or strain on the column ways and knee bearings when the feed of the machine is operating up and down.

The style of stock clamp generally furnished is operated by hand, but for a large amount and variety of work an automatic clamp can be used. The feed is hydraulic. It requires only a touch of the operator's toe to set the machine in operation.

Specifications include: ⅝" spindle size; table adjusts vertically 13"; takes all sizes of cutting equipment from 3/16 x ¾" to 1¼ x 2½".

PICTURE FRAME MANUFACTURE

Nailing mitered corners of picture frames has always been something of a problem to the manufacturers concerned. Hand nailing is slow and there is a tendency for the sections of frame to slip, resulting in uneven miters.



Arrows indicate movement of jaws which, through an equalizing toggle action, assures tight mitered corners and compensate for slight variation in thickness of wood members.

Spotnails, Inc., 1527 Lyons St., Evanston, Ill., is offering an air operated mitered corner nailer to do this particu-

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Socket Set Screws
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* Made in Slotted or "Rockford-Phillips" Heads
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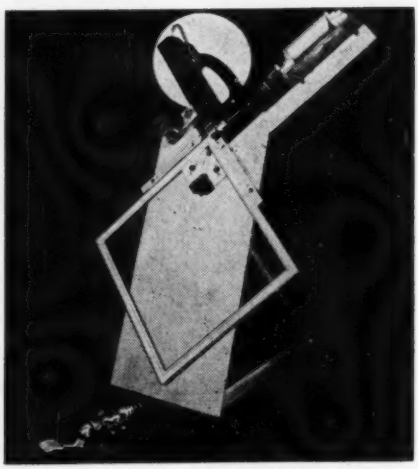


This is the complete unit being offered by Spotnails.

lar job. The machine permits an operator to nail together frames five times faster than before, it is claimed. A foot operated air valve frees hands of operator, and with delayed action first clamps the frame and then drives the spotstaple. There is an adjustable stop for ready locating of second spotstaple when double stapling of corner is desired. The unit can be mounted on any bench or table and is easily adjustable.

SPRAY GUN ATTACHMENT

A fine gauge brass screen strainer for paint spray guns which eliminates slugs, clogging and spitting thereby reducing production costs has been perfected by the Clear-flo Strainer Company, 8050 35th Ave., N.E., Seattle 5, Wash.

It is an attachment that slides over the end of the intake tube of the spray gun permitting only pure, strained finishing material to reach the nozzle

and the even flow assures a smooth and clean paint job from start to finish.

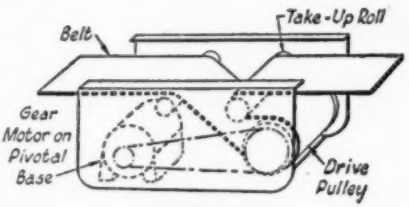
Reports from production plants indicate that an average of one man hour per gun per day is saved by the elimination of fouled nozzles in the middle of a job resulting in fewer rejects.

Manufactured of fine brass screening, precision-made so there can be no leaks or breaks at any joint the strainer eliminates the use of nylon or other materials to strain the paint or finishing material before using.

There are four different sizes of Clear-flo strainers to fit various makes of spray guns and one of its outstanding features is that it is self-cleaning, cleaned simultaneously with the spray gun.

ADAPTO-DRIVE UNIT

A new line of Adapto-Drive units has been announced by Logan Co., Louisville, Ky. Designed for driving belt or live roller conveyor, these drives can be bolted to underside of conveyor frame at any convenient location. This permits positioning drive at most accessible point for easy maintenance. The drives are also readily adaptable to



ADAPTO-DRIVE

changes in layout, converting from horizontal to incline, or vice versa.

The Adapto-Drives are available for conveyors in widths of 14", 18", 24" and 30" with package speed of 30, 60 or 80 f.p.m. Horsepower ranges from ½ to 2 h.p., inclusive. The drives can be used for driving either horizontal or inclined conveyors up to 25°.

Logan also has Adapto end units to go with these drives. Both can be furnished either with complete conveyors or purchased separately.

FAMOWOOD FOR WOOD FINISHES

The Beverly Manufacturing Company, Dept. WD, 9118 S. Main St., Los Angeles 3, Calif., is finding additional uses for Famowood where wood finishes are concerned. Famowood is an all-purpose plastic that can be used for filling wood cracks, gouges, nail and screw holes, correcting defects, etc. It is used in industries such as furniture manufacturing, sash and door, cabinetmakers, boat builders, airplane factories, pattern shops and others.

Famowood dries quickly. We are told that it does not shrink nor gum up the sander. It can be painted, varnished, lacquered, stained or oiled. There are 15 wood matching colors to choose from.

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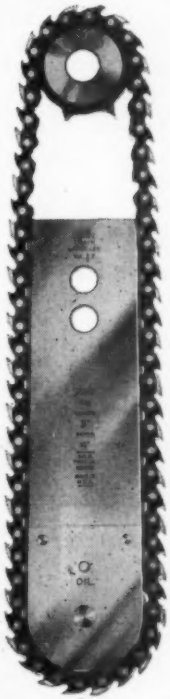
SINCE 1880

CHAIN MORTISE CUTTING EQUIPMENT



SUPERIOR chain mortise cutting equipment made possible through Field research and experience. . . . Many profit making improvements which you can test for yourself. Cut costs . . . raise quality . . . increase production with Field mortising equipment.

More than 90 standard sizes of cutting equipment to assure you an excellent product and interchangeable replacement parts.

Write for information on our chain grinders for sharpening your mortise chains.

Complete mortising equipment at . . .

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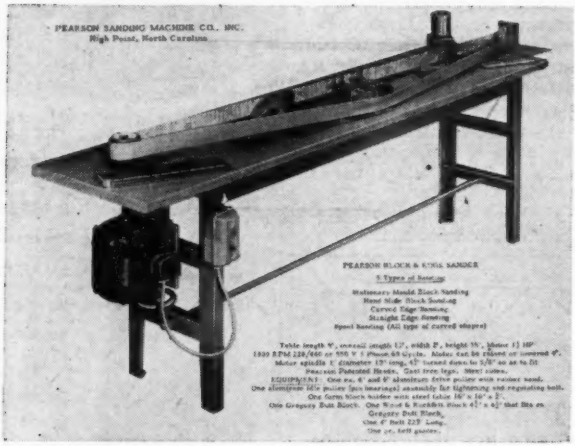
327 Dorchester Ave.
BOSTON 27, MASS.

BLOCK AND EDGE SANDER


PEARSON SANDING MACHINE CO., INC.
High Point, North Carolina
PEARSON BLOCK & EDGE SANDER
5 Types of Sanding
Stationary Mould Block Sanding
Hand Slide Block Sanding
Curved Edge Sanding
Straight Edge Sanding
Spool Sanding (All type of curved shapes)

This block and edge sander manufactured by the Pearson Sanding Machine Co., Inc., 1701 Ward St., High Point, N.C., can be used for five types of sanding. These include: stationary mold block sanding; hand slide block sanding; curved edge sanding; straight edge sanding; spool sanding (all types of curved shapes).

The table length is 9′, over-all length 11′, width, 2′, height, 35″. The motor is 1½ h.p., 1,800 r.p.m. 220/440 or 550 V., 3 phase, 60 cycle. The motor can be raised or lowered 4″.

The Pearson Sanding Machine Company manufactures scroll and drum sanders as well.

NEW ADHESIVE

Snyder Chemical Corporation, Bethel, Conn., announces the Synco 128-33 adhesives series. The "33" types are specifically adaptable to exterior, fully

IMPROVED Ball Bearing Shaper Collars

Friction between collar and pattern entirely eliminated — no more burning.

Outer rim is independent of the slotted collar and revolves with the feed of the work.

Collars can also be supplied without grooves for use with solid steel cutters.

Give diameter of collar and size of hole.

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CIRCULATION DEPARTMENT

WHEATON, ILLINOIS

WOOD WORKING DIGEST

JULY, 1953

READER'S SERVICE DIVISION

This insert (please note all four cards) is designed to help you obtain woodworking information. Any of these cards mailed to our Service Division will receive careful attention. There is also a form within the book for shop problems, used machinery, etc. Let us know when we may be of service to you. No obligation.

Please send information on PRODUCTS and SUPPLIES described on the following pages:

....

....

Name..... **Position**.....

Company .....

Street .....

City..... **Zone**..... **State**.....

PRODUCT INFORMATION

A quick, free way to obtain information about the equipment and supplies you need to buy.

- Abrasives
- Adhesives, animal
- Adhesives, casein
- Adhesives, phenolic
- Adhesives, resin
- Adhesives, resorcinol
- Adhesives, urea
- Air Compressors
- Band Saw Tires
- Bits, auger
- Bits, Forstner
- Bits, router
- Blades
- Belts
- Boring Machines
- Car Pullers
- Chisels
- Clamp Carriers
- Clamps
- Conveyors
- Cutters
- Dimension Stock
- Dowels
- Drill Attachments
- Drill Presses
- Drills
- Dryers
- Dry Kilns
- Dust Collecting Equipment
- Electric Sander Pads
- Fasteners
- Files
- Fillers
- Finishes
- Glue Equipment
- Gluer, electronic
- Grinders, knife
- Grooves
- Guards
- High Frequency Heating Equipment
- Hoist
- Jointers
- Knives, molder
- Knives, planer
- Knives, shaper
- Knives, veneer
- Lathes
- Loader Hoists
- Lumber
- Machines, banding
- Machines, box & crate
- Machines, carving
- Machines, clamping
- Machines, door and sash
- Machines, dovetailing
- Machines, dowel
- Machines, filing & sharpening
- Machines, gluing
- Machines, mortising
- Machines, nailing
- Machines, sawmill
- Machines, saw setting
- Machines, screw driving
- Machines, stapling
- Matchers
- Meters
- Moisture
- Mortise chains
- Moulders
- Nails
- Packaging Material
- Paint
- Planers
- Planes
- Plywood
- Presses, plywood
- Putty
- Routers, hand
- Rippers
- Routers
- Safety Clothing
- Sanders, automatic strokes
- Sanders, belt
- Sanders, center
- Sanders, disc
- Sanders, drum
- Sanders, endless belt
- Sanders, portable electric
- Sanders, spindel
- Sandpaper
- Sanders, variety
- Saws, arbor
- Saws, band
- Saws, chain
- Saws, cross-cut
- Saws, cut-off
- Saws, gang
- Saws, portable electric
- Saws, radial
- Saws, rip
- Saw blades, band
- Saw blades, carbide
- Saw blades, circular
- Saw Guides
- Screws
- Shapers
- Shaper Collars
- Spray Equipment
- Stackers, lumber
- Surfacers
- Tailors
- Tapers
- Transfer Cars
- Trucks, dry kiln
- Trucks, factory
- Unstackers, lumber
- Veneer
- Veneer Clippers
- Veneer Dryers
- Vises
- Washers
- Wheels
- Wood Treating Compounds

Data will come direct to you from responsible manufacturers. Your request involves no obligation.

Name..... Position.....

Company .....

Street .....

City..... Zone..... State.....

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CIRCULATION DEPARTMENT
WHEATON, ILLINOIS

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Company..... No. of employees.....

Street.....

City..... Zone..... State.....

Products.....

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waterproof bonding by room, intermediate temperature or high frequency curing methods. Advantages cited over earlier Synco 128 types are: increased storage life; longer pot life; faster cures; lower spreads; less hardener required and gluing costs lowered.

DOVETAIL KITS

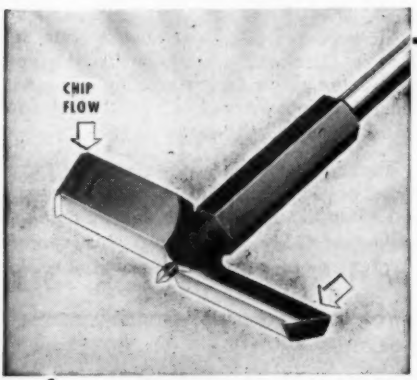
Stanley Electric Tools, new Britain, Conn., announces the addition of the H25 and H28 dovetail kits to the new line of Handyman electric tools. These kits provide the amateur woodworker with the tools to make professional dovetail joints with ease and in a minimum of time. The matching joints of the dovetail are cut with only one pass of the router, taking only about 30 seconds to cut the average dovetail joint after the kit is set up.

Both kits will handle stock up to 12" in width. The H25 kit will handle wood from 7/16" to 1" in thickness and the H28 kit will handle wood from 5/16" to 5/8" in thickness. In addition to the regular accessories supplied with the kits, GA-H225 templet is available which may be substituted for the finger templets (already packed with the kits) when it is desirable to cut dovetails on a rabbeted drawer front. The design of the GA-H225 templet takes care of the offset of the rabbet.

COMET POWER SAWS IMPROVED

A new feature of Comet power saws is a thermal circuit breaker which replaces the old style overload fuses. The saws are manufactured by Consolidated Machinery & Supply Company, 2031 Santa Fe Ave., Los Angeles 21, Calif.

Addition of the circuit breaker eliminates the necessity of carrying spare fuses. The circuit breaker makes it impossible to damage the motor by over fusing or short circuiting the fuse. Complete protection on either 110 or 220 volts is assured by simply throwing a switch which is conveniently located at the finger tips of the operator.



These Bits are job proved for high speed, accurate cutting. The two cutting edges are precision ground of the finest tool steel, scientifically heat treated.
They are designed in such fashion that repeated sharpening does not change the form of the bit.
Bit is removable from shank. Pilot can be adjusted or replaced.

PLANETOR CHIP FLOW
MACHINE BITS
are
OUTSTANDING
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Smoothness, Speed, Endurance

STOCK SIZES—1" to 4½" by 16ths, 4⅝" to 6" by 8ths on special order.

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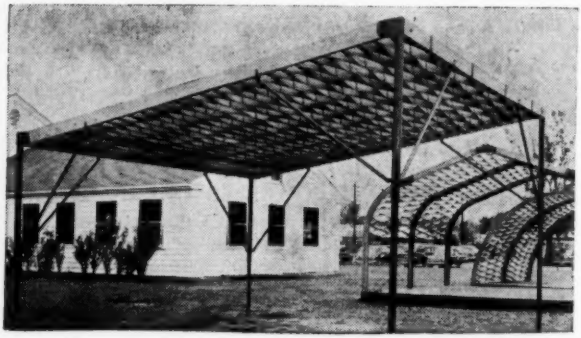
PRICE & RUTZEBECK
P.O. Box 30 **Hayward, California**

GAMBELLA FOR ROOF STRUCTURES



Here Gambella is used in a 16'x16' adjustable shed-type shelter. This lightweight material has many uses.

A roof structure that is collapsible, portable and can support any kind of roofing material, with the added feature of costing 60% of conventional construction, was shown to industry for the first time at the Exposition of Basic Materials for Industry held in New York, June 15-19.

Under the trade name of Gambella, the new type of structure was developed by Gamble Brothers of Louisville, Kentucky. It was originally designed for farm structures to simulate the quonset type structure for farm buildings. Its basic purpose: to be readily shipped in package form, and easily and quickly erected with hand tools available to every farmer.

However, when war broke out in Korea, Gambella was called to the attention of the military as a lightweight, easily transportable structure for hangers, field warehouses, etc.

Gambella can be designed for any type of structure up to 100 ft. clear span, with continuous laminated 3-hinge arch or bowstring trusses for straight side structural applications. No

STOP DUST

DUSTKOPS — **20 Models**

UNIT TYPE LOW COST — 300 to 3600 cfm ¼ hp to 5 hp

AVAILABLE FROM STOCK

For: Grinders, buffers, polishers, woodworking, lint . . . All Dusts.

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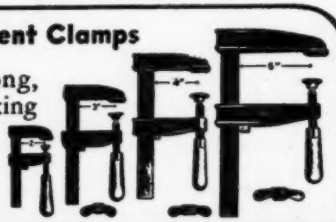
Since 1915

Deep Engagement Clamps

Designed for long, hard usage. Locking device locks instantly; will not slip or stick.

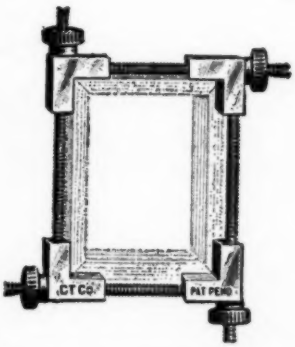


HARTFORD CLAMP COMPANY • EAST HARTFORD, CONN.

intermediate purlins are required between the arches when the Gambella structural unit is used, and because of the continuous longitudinal support, arches of relatively thin section can be used, thus reducing the weight and cost of structure. Because of its great flexibility, it can be used in cylindrical structures with easy erection and high structural strength.

MITER FRAME CLAMP

This Hargrave four corner miter clamp clamps all four corners at one time, we are told, and does not mar the work. It can be used on finished stock.



The corner blocks are aluminum alloy, light but strong. Screws are made from a good grade of steel, ¼" dia. The clamp, available from the Cincinnati Tool Co., 1949 Waverly Ave., Cincinnati 12, Ohio, is available in four sizes. The four sizes have maximum openings of 8", 12", 18" and 24"; minimum openings for all sizes is 2".

NEW TYPE BELT SANDER

A belt sander using only one rotating drum—the driving drum, direct-connected to the motor—and having small radius changeable tips for the opposite end of the belt, is being produced by the Von Jonker Corporation, Irvington Station, Indianapolis 19, Indiana. The product has been named the Von Jonker multi-shaper radius sander and is designed to handle a wide variety of work. Using an abrasive belt driven by a 1/3 h.p. motor, the machine has built-in dust collection, adjustable end and side tables, simple belt adjustments, belt guards and toggle switch to control motor.

By use of various abrasive belts the machine is versatile in shaping and finishing wood, plastic, fiber, leather, metals and glass.

PATTERN WORK SPECIALISTS
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ONSRUD & WHITNEY Automatic Shapers
Patterns Made for Less
Work Guaranteed—Quick Delivery
If you are not getting top production on your Onsrud Automatic Shapers, let our representative with 25 years' experience call at your plant.
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- Lumber Conveyors & Transfers
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Enterprise
THE ENTERPRISE COMPANY
SUBSIDIARY OF WM. K. STAMETS CO.,
MACHINERY BUILDERS & ENGINEERS,
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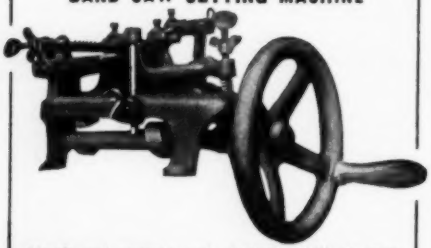
SIMPLEX
BAND SAW SETTING MACHINE



Simple yet accurate and efficient. Will do more and better work than any other machine of its kind.
The vise takes saw blades ⅛"—1½" in width and by automatically gripping the saw while tooth is being set, prevents twisting of narrow saw blades. The feed finger is adjustable to teeth with ⅛"—⅜" spacing, point to point.
All adjustments for different widths, teeth, etc. are regulated by but two thumb screws.
Best working speed 100 revolutions (200 teeth) per minute, each revolution setting two teeth. A saw can be set in 4 to 5 minutes.
The machine can be fitted with a flat or V pulley for power operation if desired.

Further Details Upon Request

ZEILLER & NAGEL, INC.
232 JAVA ST. BROOKLYN 22, N. Y.

½ to 8 qt. woodworkers glue pots.

IF YOU HEAT GLUE heat it Electrically in Sta-Warm Glue Pots

The standard of the industry for more than a quarter of a century.

Sta-Warm ELECTRIC CO.
105 N. CHESTNUT ST. • RAVENNA, OHIO

Prompt Delivery
Factory Trucks

Size 1
24" x 48"
Size 2
30" x 48"
Size 3
30" x 60"

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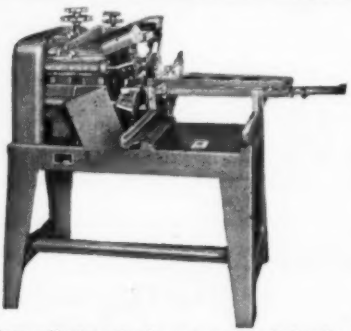
Jakes Foundry Co.
400 - 29th Ave. Nashville, Tenn.

HARRIS
DELUXE FLOOR MODEL TENONER



New adjustment allows exact and simultaneous adjustment of tenon spindles.
3 H.P. Motor.
3 Inch Blades
V Belt pulley drive on both tenon and cope spindles.
Heavier Construction for greater accuracy

MILLBURY MACHINE COMPANY
13 WATERS STREET, MILLBURY, MASS.

A History of Borden Adhesives

The Borden Company's Chemical Division, a major supplier of industrial adhesives in America, dates back to 1900, when the Casein Company of America was formally incorporated. Starting with the production of casein adhesives, the Borden Company's Chemical Division has branched into synthetic resins, molding compounds and many types of industrial adhesives.

Acquired by Borden's in 1929, the Casein Company of America became the Chemical Division in 1948.

A series of serious problems faced the Casein Company shortly after its founding. Coating mills and other potential customers had to be sought out, and creameries had to be persuaded to produce raw casein of a uniform quality to insure a reliable source of raw materials. Affiliated plants in England, France and other countries aided in this early work.

As the quality improved, new uses for caseins were found in other fields. During World War I a good cold-water-soluble, waterproof casein glue was developed for use in the manufacture of wood-and-canvas airplanes of that era. Out of this single development grew the long list of highly specialized casein glues now used by the wood industry.

By 1929, the year the Borden Company acquired the Casein Company, caseins were used in the manufacture of artificial textiles, label glues, medicinal products and cosmetics. In 1937, then a division of the Borden Company, the Casein Company of America began producing Casco flexible cements and liquid urea resins. The Casco name had long been known in the adhesive field even at that time, through products of the Casein Company of America.

Dry powder urea resins and liquid and dry powder phenol resins had been added to the division's line by 1940. By 1947, when Durite Plastics, Inc., of Philadelphia, was acquired, its phenol formaldehyde molding compounds and other industrial resins supplemented the division's line.

In spite of this diversification of interests, casein products are still a very important segment of the division's operations. Examples of new uses of caseins, as developed in Borden's laboratories, include Protovac PV-416, which aids in the reduction of imperfection in coatings used for paper printing plates and Protovac PV-20, which has recently been approved for use as a wine clarifying agent by the United States Treasury Department. Protovac is a chemically prepared caseinate designed for a wide range of uses.

Plywood test panels on the "fence" at the laboratory. Exposed to the elements for years, these test panels prove the relative weather resistance of the different types of adhesives manufactured by Borden.

The Casein Company of America, as a division of the Borden Company, pioneered in the use of urea formaldehyde resins in America, securing the rights in this country from Germany's I. G. Farbenindustrie in 1936. The furniture and plywood industries, in particular, benefitted from this program. As a result, urea formaldehyde resins are now being manufactured at Borden's at

New large table provides greater working area! No extra cost!

•

The New H & A 14K Band Saw makes work easier, speeds production.

Heavy (20"x23") grey iron tilting table actually equals in size tables used with much larger saws. Yet cost remains low! Money and time saved, too, through exclusive device, which makes blade changing simple, done in a Jiffy! All moving parts guarded for maximum safety.
WRITE TODAY! Write for FREE circular name of nearest authorized dealer.

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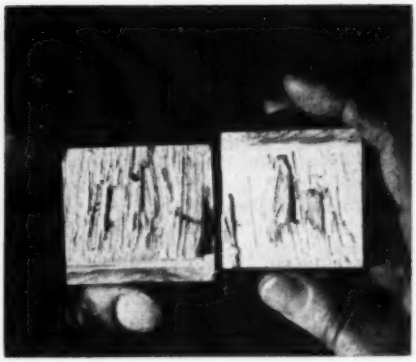
Division of St. Paul Foundry & Mfg. Co.
11-14C FAIRFIELD, IOWA

Bainbridge, New York and Seattle, Washington.

Ten years later, in 1946, the division expanded and began producing formaldehyde, urea resin and phenolic resin glues for the plywood industry at Springfield, Oregon. At the same time, a new unit was opened at Kernersville, North Carolina, producing urea resin adhesives for the southern furniture and plywood industries.

Only one year later, in 1947, Borden's purchased the Durite Company for the production of molding compounds, industrial resins, lamp-basing resins, shell molding and molding resins.

Besides these products, formaldehyde and hexamethylenetetramine is being produced at Demopolis, Alabama, and resorcinol at a recently completed plant at Dominguez, California. Both of these operations have reached the point in production where they have a saleable surplus of their product available, although full plant capacity has not been reached at either plant.



Maple block specimen sheared on the Olsen block shear testing machine. Tests for high shear strength and high percentage of wood failure are part of the Borden production control procedures.

Borden's laboratories are constantly at work to maintain the company's position in the industrial adhesive field. One new chemical product, for example, "Epiphen XR-823," produced after lengthy laboratory research, is expected to have a tremendous effect upon the aircraft industry. If this type of adhesive, designed to bond nonporous surfaces, lives up to its early promises, it may be used in place of rivets in aircraft production.

The Borden Company's Chemical Division, under the guidance of William F. Leicester, who was an officer of the Casein Company of America, and who is now a vice-president of the Borden Company in addition to heading the division, is divided into eight departments. They are the Specialty, Packaging Adhesives, Industrial Adhesives, Foundry Products, Durite Products, Casein, Export and Packaged Products Departments.

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Adhesive Products Corp., page 182, Booklet.

BOLT DRIVERS
Titan Tool Co., page 88, Literature.

BORING MACHINES
B. M. Root Co., page 32, Catalog.

CLAMPS
Black Bros., page 7, Bulletin.
Adjustable Clamp Co., page 88, Catalog.
Union Tool Corp., page 175, Booklet.
James L. Taylor Mfg. Co., page 184, Catalog.

CUTTERS & KNIVES
Diehl Machine Works, page 34, Bulletin No. 452.
Samuel J. Shimer & Sons Inc., page 57, Catalog.
Jones & Orth Cutter Head Co., page 79, Catalog.
Newton Mfg. Co., page 143, Bulletin.
Stalter Edge Tool Co., page 147, Catalog.

DRY KILNS
Standard Dry Kiln Co., page 20, Catalog.

DUST CONTROL EQUIPMENT
Dixie Mfg. Co., page 183, Booklet.
Aget-Detroit, page 184, Catalog 605a.

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Jakes Foundry Co., page 196, Literature.

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Koppers Co., page 13, Booklet.
Consolidated Chemical Industries Inc., page 170, Folder.

HARDBOARD
Simpson Logging Co., page 26, Sample and Literature.

HIGH FREQ. BONDING EQUIP.
Radio Receptor Co., page 45, Brochure No. WD-28.

MOLDERS
W. P. Childs Machinery Co., page 76, Literature.

MORTISERS
Powermatic Machine Co., page 87, Literature.

PLANERS & SURFACERS
Buss Machine Works, page 6, Bulletin
Baxter D. Whitney & Son, page 9, Bulletin.

PRESSES, PLYWOOD
Wilco Machine Works, page 25, Literature.
Heyer Sales & Eng. Co., page 25, Literature.
Columbia Machinery & Eng. Co., page 106, Bulletin No. 5236.
V. Berthelsen Eng. Works, Inc., page 119, Booklet.

ROUTERS
Porter-Cable Machine Co., page 75, Manual.

SANDING MACHINES & EQUIPMENT
Beach Mfg. Co., page 4, Folder.
Sundstrand Machine Works, page 29, Bulletin.
National Air Sander, page 58, Catalog.
Speed Way Mfg. Co., page 100, Circular.
J. M. Nash Co., page 160, Literature.

SAW BLADES, SAWING MACHINES & EQUIP.
Tannewitz Works, page 22, Bulletin.
Mereen-Johnson Machine Co., page 50, Bulletin No. 210B.
Foley Mfg. Co., page 74, Literature.
Irvington Machine Works, page 174, Brochure.
G. M. Diehl Machine Works, page 176-177, Bulletin MRS-1052.
W. F. Meyers Co., Inc., page 178, Catalog.
Rudolph Bass, page 185, Catalog.
Tannewitz Works, page 192, Catalog.
Heston & Anderson, page 198, Circular.
Moak Machine & Tool Co., page 201, Booklet.
The Saw & Knife Specialty Co., page 101, Catalog WWD.

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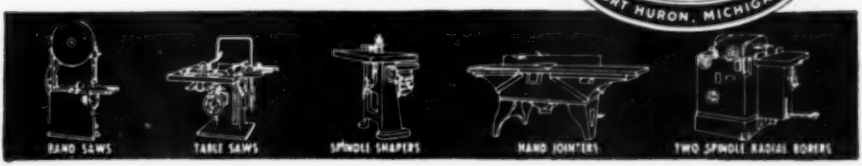

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PRODUCTION SUPERINTENDENT

Large, well established furniture factory in Montreal, Canada, manufacturing a line of modern, veneered bedroom suites, requires an experienced production man. Should be familiar with time study and cost procedures. Kindly state all particulars in first letter, including age, history, and salary expected.

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WANTED
MACHINE ROOM FOREMAN

Nationally known manufacturer of fine occasional tables in mid-south, wants machine room foreman capable of supervising quality and production. Must be familiar with piece work procedures. Kindly state all particulars in first letter including age, history and salary expected.

Address replies to Box 841

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Wheaton, Illinois

FORK TRUCK DRIVER COMPETITION INCREASES OPERATING SAFETY

Here are the details of a unique fork truck driver competition that has spelled increased safety for the truck operators at the American Finishing Company, Memphis, Tennessee. It has also been responsible for decreased operating costs and equipment maintenance charges.

Each truck is assigned to a certain driver. If he is caught handling his equipment in a rough manner, or damaging material with his equipment, he is warned. The second offense means a one-day layoff. The third offense demands a one-week layoff. The fourth offense automatically calls for discharge. The second or third could conceivably call for discharge if the extent of the damage or the employee's attitude warranted it.

When the company receives a new truck, the selection of the driver is contingent upon his safety record and his cost record of truck operation. In assigning the new equipment to the driver, the company points out the reasons for his selection.

Proof of the success of the operation: competition is so keen for a truck job, that it takes five years to become eligible.

Operators are enthusiastic about the competition, and the company finds costs have tumbled. For example: the cost of operation of a single truck for an entire year, including amortized cost of the truck, is only $1,358.94. In addition, it must be realized that this equipment runs in some departments during three 8-hour shifts, bringing down the average cost to $452.98 for one year for one 8-hour shift per day.

At American Finishing, the trucks have compiled an amazing record for more efficient handling. As shown in the photograph, for example, carloading time has been slashed from 28 to 1.3 manhours; workers formerly used for this back-breaking task have been freed for more productive jobs within the company. The trucks have also increased the use of storage space 250%; a truck stores 54 palletized rolls in space previously occupied by 15.

POLYCO 505

A new water resistant polyvinyl acetate emulsion, for adhesives and paints, has been announced by the American Polymer Corporation, Peabody, Mass. This product, Polyco 505, provides a unique vehicle for the formulation of paint primers, concrete paints, and water resistant adhesives. Suggested formulae and samples of Polyco 505 are available upon request.

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20" Delta, New
26" American P. B.
36" Moak M.D. (new)
36" Crescent, B.B. M.D.
36" Fay & Egan No. 50

BAND RESAWS:
Yates V-4 54" L.H. Vertical M.D.
Connell & Dengler 60", $1500

BORING MACHINES:
American—Clement 2 spindle Hor. Radial Bore
Andrews 72" Ball Br. Vert. Power Feed 8 Spdl.
Fay & Egan No. 312 Vert. 48" cap. 6 Spdl.
Fay & Egan Vert., 6 spindle Borer, 36" Capacity
Root Sgl. Spindle Motor on Spdl.

BOX MAKERS MACHINERY:
Tidey Box Makers Rip Saw
Doig 18 track C.B. Cleater

CLAMPING MACHINES:
American 4'x8', Figure 8853
Hayes Power Door Clamp
Laidlaw 3½"x8 Door Clamp, $250

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Greenlee No. 453 C.O. Automatic

DOVETAIL:
Dodd 15 spdl. M D. rebuilt like new

DOWEL MACHINES:
Hawker No. 3
Fay & Egan No. 406 Rod Machine

JIG SAWS:
Jones Superior No. 46 Self Contained M.D.
Beach No. 1 Ceiling Suspension

JOINTERS:
Crescent 8" H.D. Ball Br. D.M.D.
Egan 16" Rd. Head, $185.00
Fay & Egan No. 61 24", $275
Fay & Egan No. 316 20" B.B. M.D.
Moak 12" new D.M.D.
Porter No. 300-C 24" Ball Brg. Jointer, 4 knife head with 10 h.p. 3 ph. D.M.D., used less than 3 months

KNIFE GRINDERS:
Dependable 36" M.D., new
Fay & Egan St. Wheel - 30"
American No. 100 St. Wheel - 30"

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American No. 505 10" P.B.
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American Sash Relisher
Greenlee No. 604 Sash Relisher
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Hayes 4 Spdl. Stile Boring Machine
American Comb. No. 1 Sash Jointer & Sander

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Fay & Egan No. 265 Double spdl.
Fay & Egan No. 552 Sgl. Ball Br. M.D.
Anderson Double Motors on spindles
Walker Turner No. S-1140

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American 2 side Door Sticker

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Smith Dbl. End 2 Copes & C. O. Saw Bab. Brg., B.D.
American S. E. No. 5 Copes C.O. Saw
American No. 1 Sgl. w. copes & C.O. Saw
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Yates No. 156 20" rd. hd. M.D.
Yates No. 177 30"x12" double, M.D.
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Yates C55 9" DMD All Electric
Yates-American, 18" DMD C55, BB
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Whitney No. 32, 30" BB, Belt Drive
Whitney No. 29 40" CMD, BB
Whitney No. 24, 30" Double—CMD

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Yates C-3-A, 4" Four-side, b-b, m-d.

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Racine floor type, motor-driven.

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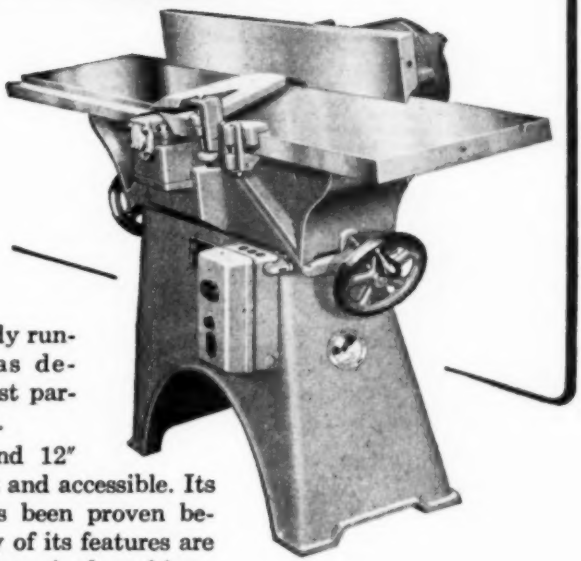

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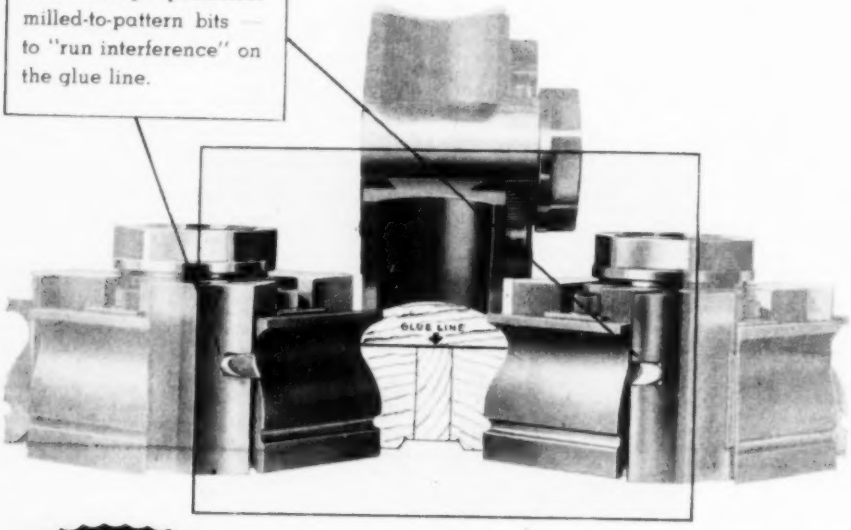
WHEN YOU HAVE STUBBORN GLUE LINES TO CONTEND WITH...

Note the Carbide Tipped Plug Cutters — mounted between high speed steel milled-to-pattern bits — to "run interference" on the glue line.



BADGER CUTTERHEADS EQUIPPED WITH CARBIDE TIPPED PLUG CUTTERS ARE THE ANSWER!

The production of stair-rails using glued-up stock has presented a machining problem along the glue line. This condition has been successfully handled by use of carbide plug cutters added to standard Clamp "T" Slot Milled-to-pattern Heads. Production engineered use of Carbide is often just that simple!

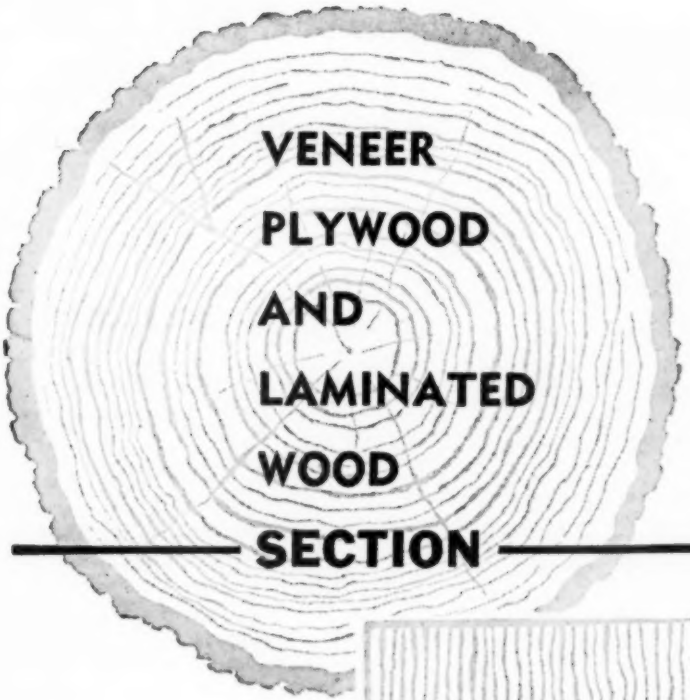
When machining glued-up stock, laminated materials, plywood, and plastic-coated tops, the addition of carbide tips to your cutterheads will assure not only longer production runs but also relatively infrequent sharpenings and better surface finish.

If *you* have an unusual tooling problem involving a stubborn glue line or the use of some of the synthetic laminated materials, carbide cutters are no doubt your best answer.

Send in details on your cutting problems today!

WISCONSIN KNIFE WORKS BELOIT, WISCONSIN

Engineers to the Woodworking Industry



VENEER PLYWOOD AND LAMINATED WOOD SECTION

Features . . . .

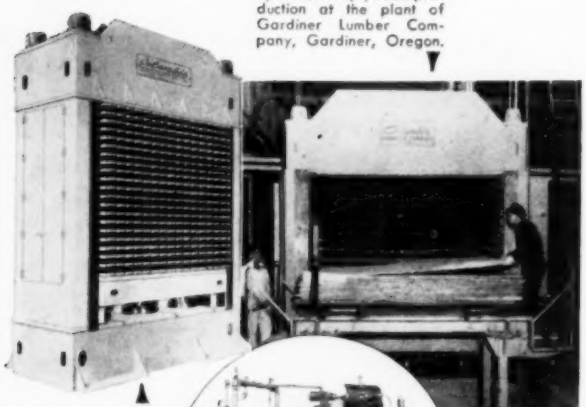
Veneer and Plywood
Machinery
Part 5
By Thomas D. Perry

Veneer and Plywood
A Door and Its Core
By Ned Bailey

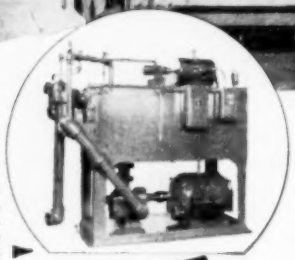
Smooth... PRODUCTION-PROVED PLYWOOD PRESSES

Columbia Hydraulic Hot Plate Press design exclusives are production-proved . . . and smooth . . . . .

One of two 4' x 8', sixteen opening Columbia Hydraulic Hot Plate Presses operated for plywood production at the plant of Gardiner Lumber Company, Gardiner, Oregon.



20 daylight Standard Columbia Hydraulic Hot Plate Press, open.



Columbia Hydraulic System showing arrangement for gravity feed to high volume pump.

Other Columbia design exclusives influence platen heating, labyrinth features, steam lines, opening and timing, pumps and pressure lines, and even use of materials.
To get the full story, write for our free Bulletin No. 5236. Address Columbia Machinery and Engineering Corporation, Hamilton 4, Ohio.

Consider ONE FEATURE

A high volume pump and a high pressure pump, pumping oil directly into the cylinders, operates simultaneously to close the press. At the start of the pressure stroke, the high volume pump cuts out while the high pressure pump continues without interruption. The usual drop in pressure at this change-over point is eliminated; operation is smoothed.

As preset pressure is attained, and the high pressure pump motor cuts out, excess oil, pumped during coast of motor, by-passes through a solenoid valve to prevent override of pressure. Smooth!

So too, a special pilot operated drain valve provides for the smooth release of pressure and rapid press opening at end of cycle.

new series

Columbia HYDRAULIC HOT PLATE PRESSES

Dennis Veneer Taping Machine

Over 2000 in Use

Something New

The McLaurin-Jones Company, Brookfield, Mass., one of the largest manufacturers of veneer tape, has developed with our cooperation, an impregnated tape which can be laid face down.

Adhesion is fully equal to where stock is wood to wood.

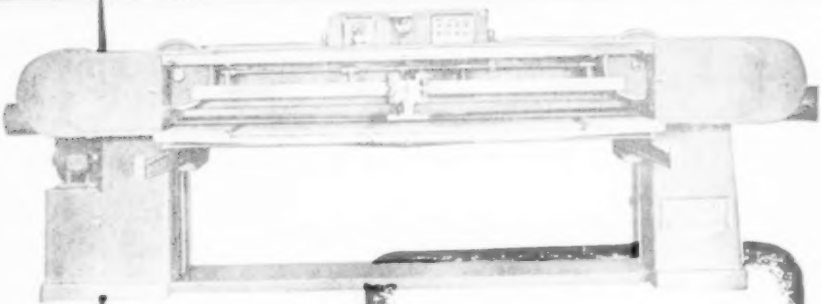
Most economical process for joining face veneer.

Write us or McLaurin-Jones Co. for further information.

THE VENEER MACHINERY CO.
613 Michigan Nat'l. Bank Bldg. Grand Rapids, Mich.

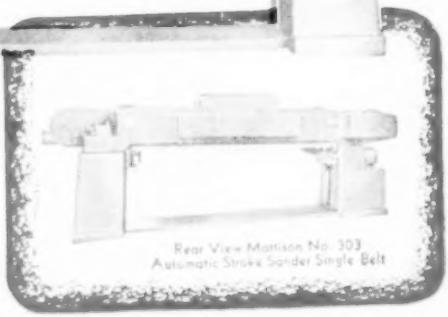
ALSO MANUFACTURERS OF A NEW TYPE CONTINUOUS FEED VENEER JOINTER

MATTISON'S NEW
No. 303 Automatic STROKE SANDER



Front View Mattison No. 303 Automatic Stroke Sander — Single Belt

Mattison No. 303
Automatic Stroke Sander — Double Belt



Rear View Mattison No. 303 Automatic Stroke Sander Single Belt

• The Mattison No. 303 Automatic Stroke Sander is the last word in modern engineering. From the standpoint of design — construction — smoothness of operation and appearance, it is in a class by itself. Results that can be expected are faster output, better quality of work, and trouble free operation. These important features are all to your advantage. Hydraulic system for operation of shoe is simple yet positive in action, providing smooth operation of sanding shoe the entire length of stroke. Belt speeds to meet your needs. All controls are within easy reach of operator. The sand belt is completely enclosed at top and both ends for dust control and safety. Belts are easily and quickly changed. Aluminum sanding shoe is mounted on ball bearings for easy operation and control. Massive base and column construction provide solid foundation. The Mattison No. 303 Automatic Stroke Sander is recommended as the most efficient method for finish sanding large, flat surfaces such as tops, panels, doors, etc. It provides perfect work on a real production basis. Double-belt model with coarse belt for removing tape and glue, and fine belt for finish sanding, speeds up production by reducing handling time and, in many cases, eliminates drum sander operation.

Send for complete information on the 303, the latest in stroke sanders.

MATTISON MACHINE WORKS

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